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CONARC SOFT SKILLS TRAINING CONFERENCE.

Sponsored by

US Continental Army Command

Proceedings of a
Conference held at
US Army Air Defense School,

Fort Bliss, Texas,

12-13 December 1972,

⑨ Final Report. (Five Volumes *all included in*
th...)

VOLUME I

EXECUTIVE SUMMARY

GENERAL RALPH E. HAINES, JR.
Commanding General
US Continental Army Command

MAJOR GENERAL IRA A. HUNT, JR.
Deputy Chief of Staff for Individual Training
US Continental Army Command

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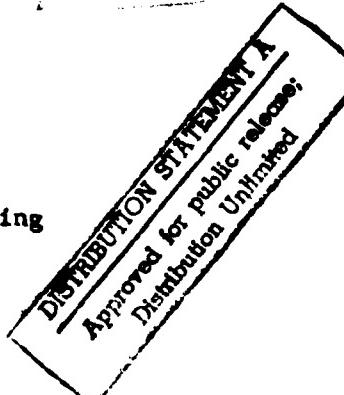
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ATIT-E   5 April 1973

SUBJECT: Report of CONARC Soft Skills Training Conference

SEE DISTRIBUTION

1. Attached are three copies of the CONARC Soft Skills Training Conference Report for distribution.

2. Request each individual from your organization who attended the conference be provided a copy.

FOR THE COMMANDER:

1 Incl   W. L. HINSPETER
as   LTC, AGC
                                                Asst AG

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Soft Skills Analysis	Learning Centers	Soft Skill Training
Job Analysis	In-Basket Test	
Task Analysis	Methods and Media	
Learning Analysis	External Training	Quality Control
Instructional Systems	Leadership Evaluation	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The CONARC Soft Skills Training Conference was conducted at the Air Defense School, 12-13 December 1972. The conference stated purpose was to foster an extensive interchange among CONARC representatives and invited speakers/participants regarding approaches to the system engineering of soft skill training.

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EXECUTIVE SUMMARY

The CONARC Soft Skills Training Conference was conducted at the Air Defense
School, 12-13 December 1972. The conference achieved its stated purpose of
fostering an extensive interchange among CONARC representatives and invited
speakers/participants regarding approaches to the system engineering of
soft skill training. Recommendations were submitted for facilitating the
systems engineering of these skills.

After a welcome and presentation by BG Ernst E. Roberts, Assistant Com-
mandant of the Air Defense School, the mission and nature of the conference
were discussed in an opening statement by Colonel G. E. Handley, Chairman
of the Conference. Dr. Robert F. Mager, followed with a presentation on
"Goals Analysis" which emphasized utilization of a systematic approach to
determining training requirements from "soft skilled" job requirements by
converting these job requirements to goals and behavioral objectives. A TV
recording of this presentation is being prepared for distribution on request
to CONARC Training Aids Agency, Fort Eustis, Virginia 23604. In order to
secure said presentation a 60 minute video cassette tape must be submitted.
A series of presentations concerning the application of the systems approach
to soft skill course design were made by civilian and military educators.

Dr. Paul Whitmore, HumRRO, defined soft skills and explained the use of
a behavioral model, developed in Project MODMAN, as a tool for analyzing
soft skills. The remainder of the morning session was devoted to the
presentation of four approaches to the systems engineering of soft skills
by separate CONARC schools. The Chaplain School presented an approach
which was unique in that it involved the entire resident faculty in systems
engineering the Chaplain's Officer Advanced Course, and provided students
organized into small learning groups the opportunity to modify the means
of achieving the objectives established by faculty committees. The WAC
School presented a philosophical approach which considered cybernetic
principles and recognizing process as an important element in course
structure. In the Ordnance School approach, broad tools statements were
accepted initially in soft skill areas and later reduced to more specific
behaviors resembling skills and knowledges. This approach tends to re-
cognize skills and knowledges as the real training requirements in the
truly soft skill areas. In the approach developed by the Infantry School
for designing eight combat MOS courses, the common soft skill tasks are
broken down into more specific sub-tasks which then can be measured.
Dr. Gerald Nadler of the University of Wisconsin described a systems de-
sign model in which "identification of functions" was the primary feature.

After the approaches were presented, conferees were organized into small
working groups and each of the presentors were scheduled to appear for
twenty-five minutes in each of the five discussion groups to answer any
questions and discuss the approach previously presented. The groups pre-

pared reports of findings with conclusions and recommendations. The majority of these groups agreed that the application of the systems approach to soft skill training is feasible but presents an increased challenge not faced in hard skilled courses. It was the concensus of the groups that the use of the terms "Soft Skill" and "Hard Skill" be deemphasized or discontinued. The need for additional comprehensive examples and training in the systems process were also suggested.

On the second day of the conference three simultaneous workshops were conducted which considered areas of: Methods and Media; Developments in Soft Skill Training and Quality Control. Summaries by each of the chairmen follow.

Selected conferees attended a working session which considered the progress of HumRRO Project SMARTT on 14 December 1972 and participated in a data collection exercise. Project SMARTT is concerned with criteria and techniques for selection of methods and media for instruction.

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CONARC SOFT SKILLS TRAINING CONFERENCE

Sponsored by

US Continental Army Command

and

Hosted by

US Army Air Defense School

Fort Bliss, Texas

12-13 December 1972

Final Report - Five Volumes

VOLUME II

APPROACHES TO SYSTEMS ENGINEERING SOFT-SKILL COURSES

GENERAL RALPH E. HAINES, JR.
Commanding General
US Continental Army Command

MAJOR GENERAL IRA A. HUNT
Deputy Chief of Staff for Individual Training
US Continental Army Command

APPROACHES TO SYSTEM ENGINEERING SOFT SKILL COURSES

CONTENTS

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SCHEDULE

for

APPROACHES TO SYSTEMS ENGINEERING SOFT SKILL COURSES

12 December 1972

Chairman: Dr. W. E. Cruse
Educ Advisor, USAFAS

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AM

0930-1010	What are Soft Skills? The Behavioral Model as a Tool for Analyzing Soft Skills	Dr. P. Whitmore HumRRO
1010-1030	System Engineering of Soft Skill Courses	CH (LTC) H. Lamm USACHS
1030-1035	Break	
1035-1055	A Functional Approach in Design of Soft Skill Training	CPT Y. Burger USWACS
1055-1115	Systems Engineering the Ordnance Officer Advance Course	Mr. W. Davis USAOC&S
1115-1140	Systems Approach in Designing Courses for Eight Combat MOS	LTC M. Lyman USAIS

PM

1245-1450	Working Group Discussions	
1450-1520	The "IDEALS" System Approach	Dr. G. Nadler
1520-1620	Preparation of group report on Approaches to System Engineering Soft Skill Courses	
1620-1705	Plenary Session	

SOFT SKILL CONFERENCE

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WHAT ARE SOFT-SKILLS?

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Work Unit MODMAN is concerned with developing procedures for ⌐ystems engineering of "soft-skills," such as, command, supervision, counseling, and leadership. At the outset we wanted to find out what the term "soft-skills" meant to staff members of the CONARC schools, since they are our clients. There seemed to be several dimensions on which one could define a "soft" to "hard" continuum of skills. We developed a questionnaire, employing nine (9) dimensions and asked knowledgeable representative of the various CONARC schools to judge 35 general job functions on these nine dimensions. The 35 job functions cut across a majority of officer jobs.

We sent two questionnaires to each of 29 CONARC schools. There were 35 respondents from 21 of the schools for a 72% overall return rate. One of the delinquent schools, The Army War College, did not see the relevance of the questionnaire content to their curriculum.

Reliability of Measurement

Our first analysis was to determine by inspection the usefulness of the nine dimensions as measurement devices. We were forced to eliminate one dimension, "Assessibility of Criteria," because most respondents failed to agree on where the various job functions lay on that dimension. In other words, its distributions of scores were generally either flat or bi-modal. Thus, eight dimensions survived this test of consistency.

Three of these dimensions were intended to help clarify and distinguish between what is meant by "soft" and "hard" skills. The remaining four dimensions were intended to test the hypothesis that many of you were having difficulty in trying to systems engineer the listed job functions or similar ones because of inadequate document descriptions. Thus, the results of the questionnaire will be discussed in two sections.

What are Soft Skills?

The CONARC regulation on systems engineering (CON Reg 350-100-1) of training defines "soft skills" as:

"...job related skills involving actions affecting primarily people and paper, e.g., inspecting troops, supervising

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office personnel, conducting studies, preparing mainte-
nance reports, preparing efficiency reports, designing
bridge structures /p. 2_8/."

This definition leaves much to the imagination. The three dimensions
on the questionnaire were:

(1) Degree of interaction with a machine,

(2) Degree of specificity of the behavior, action, or process
to be performed, and

(3) Typical kind of on-the-job situation.

Table 1 (Appendix A) shows the median* response by the 35 respondents
to each of the 35 common officer job functions on each of the three
dimensions.

In addition, the judged importance of each job function is included in
the table.

The dimensions and the categories on each dimension are defined as
follows:

A. Importance. Indicates how important the judges felt each
job function is, relevant to jobs held by graduates of the Officer
Advanced Course (C-22). Categories on this scale were: Great,
High, Moderate, Low, and Little.

B. Degree of Interaction With a Machine Required by the Job
Function. At one extreme, an individual constantly operates a machine
(such as a radar scope) or fills out a piece of paper (such as a
maintenance form). At the other extreme, a job incumbent may
manipulate machines (or forms) as entities but does not actually operate
them or fill them out per se. For example, a commander may use the

---

*NOTE: The median measure of central tendency is preferred here
because the scales used were ordinal; equal intervals cannot be
assumed. As it turned out, for almost all scales, the mean was more
moderate and the mode was more extreme than the median, indicating
rather skewed distributions of scores.

mental image of radar scopes or maintenance forms in solving a
problem, but he need not interact with them directly. (In a sense,
the term "man-ascendant" refers to the latter extreme, where man
is in control or dominates. In contrast, "machine-ascendant" refers
to jobs where machines dominate.) Categories here were: Always,
Some, Moderate, Little, and Never (or indirectly).

C. Degree of Specificity of the Behavior to be Performed.
This dimension also includes actions or processes to be performed.
At one extreme, they can be explicitly stated and their application
on-the-job is also quite specific. For example, there probably is
only one way to change the oil in a given vehicle. At the other
extreme, behavior, actions, or processes are either implied within
some context or application on-the-job is quite generalized. An
example might be the requirement that the commander be able to
motivate or lead troops, whenever and wherever the situation calls
for it. Categories on this scale were: Very Specific (V Spec),
Specific, Moderate, General, and Very General (V Gen).

D. Typical Kind of On-the-Job Situation. This dimension
defines a continuum of on-the-job situations from established to
emergent. In established situations, (a) physical and social
environmental conditions are known, and (b) the consequences of
alternative courses of action are known. On the other hand, in
emergent situations, (a) not all physical and social environmental
conditions have been determined, and (b) the consequences of
alternative courses of action are not always known. Usually, job
functions in emergent situations are also associated with a large amount
of uncertainty.

Judges rated each job function relevant to on-the-job situations as
they were deemed to exist for job encumbents. Categories were:
Very Established (V Estab), Established, Medial, Emergent, and
Very Emergent (V Emer).

Most of the job functions were judged to be of Great importance; none
were thought to be of low or little importance to the C-22 graduate.

Likewise, most of the job functions were judged to Never "interact
with a machine"; only two job functions were thought to even interact
to a moderate degree (#29 and #30).

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Results on the "degree of specificity" dimension were also pre-
dominantly one-sided (i.e., General or Very Gen). Only three
job functions were judges Specific or Very Spec (#3, #31, and #35).

Finally, and consistent with the above dimensions, only three job
functions were judged to be Established (#3, #30, and #31).

In general, distributions of scores on the three dimensions were
very similar across all 35 job functions.

However, several job functions revealed inconsistencies among the
three dimensions. For example, #3, "Interprets and Uses a Military
Map" was purposely included in the set of job functions as a "hard"
skill that made use of paper. Apparently, most of the 35 judges
felt that using paper in this way was not the same as interacting with
a machine. On this basis, it would be categorized as a "soft-skill."

On the other two dimensions 79% of the respondents felt that processes
for using a map were explicit and constituted a specific application.
Sixty three percent felt that the job situations for using maps were
known. The responses on these two categories would cause it to be
categorized as a "hard-skill." Thus, it appears that including "paper"
in a definition of "soft" skills requires an explanation of how that
"paper" is used. Does the user fill in standardized blanks or does he
use "paper" to manipulate ideas or objects as mental images.

A tentative definition of soft skills might be formulated as follows:
Soft-skills are (1) important job-related skills (2) which involve
little or no interaction with machines (including standardized because
the situation or context contains a great deal of uncertainty; that is,
we don't know much about the physical and social environments in
which the skill occurs and we don't know much about the consequences
of different ways of accomplishing the job function. In other words,
those job junctions about which we know a good deal are hard skills
and those about which we know very little are soft skills.

Adequacy of Document Descriptions.

The systems engineering process described in the CONARC regulation
relies heavily on the use of Army documents. Hence, our next area
of concern was with the adequacy of these documents for systems

engineering of soft skills. Four dimensions on the questionnaire were co·cerned with documentation in addition to "Importance," as follows:

A.   Importance. Indicates how important the judges felt each job function is, relevant to jobs held by graduates of the Officer Advanced Course (C-22).

B.   Document Description of Behaviors to be Performed. Here judges were asked to indicate how well existing Army documents (manuals, pamphlets, reports, etc.) describe behaviors, actions, or processes for performing each of the given job functions. If documents describe them in such a manner that an individual can actually perform the function, given only the information in the documents, then one extreme of the dimension was met. On the other hand, if documents fail to describe necessary behavior, action, or processes at all, then the other extreme of the dimension was met.

Categories here, as well as the next two dimensions below, were: Very Adequate (V Ad), Adequate, Moderate, Inadequate, and Very Inadequate (V Inad).

C.   Document Description of Conditions of Performance. Here existing Army documents were judged as how well they describe the critical characteristics of the conditions or situations in which each job function will be or is performed. One extreme was represented by documents which fail to describe any situations or conditions. Where existing documents describe any situations or conditions in such a manner that an individual can develop a broad range of realistic (simulated) training situations or conditions for problem practice or testing purposes, then the opposite extreme was represented.

D.   Document Description of Standards of Performance. This dimension asked for an estimation as to how well existing Army documents describe standards of performance or criteria for assessing on-the-job effectiveness of the given job function. The extremes are similar to those outlined above.

E.   Specification of Job Requirements. Systems engineering of training requires that the analyst develop a trial inventory of meaningful and useful tasks. Here judgments were made concerning the degree of difficulty in accomplishing this step for each given job function. Categories here were Very Easy (V Easy), Easy, Moderate, Difficult, and Very Difficult (V Diff).

A quick scanning of Table 2 (Appendix B) readily reveals that although most of these job functions are judged to be quite important, the existing Army documents do not provide an adequate description of the behaviors, conditions, or standards associated with most of these job functions. If the information about these job functions is not in the Army documents and if it is not known to staff members at the CONARC schools, then it is likely that it is also not known to job incumbents in the field. We clearly need some different approaches that will provide us with good information about the behaviors, the job situations, the conditions, and the standards for these kinds of job functions.

THE BEHAVIORAL MODEL AS A TOOL FOR ANALYZING "SOFT SKILLS"

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The Analysis of Purposes and Situations

We cannot evaluate a worker's performance until we know the purposes of his job and the situations in which the job is to be performed. And we cannot train others to do this job until we know what movements or acts will achieve the purposes of the job in the situations in which it is to be performed. The object of systems engineering is to identify the purposes of the job and the situations in which these purposes are to be achieved, the cognitive and perceptual-motor acts for achieving these purposes, and the selection practices and training experiences which will best produce sufficient numbers of people to do the job at the least cost.

Let's begin with the identification of purposes and situations. Sometimes we analyze purposes first and sometimes we analyze situations first. And sometimes we go from one to the other and back again. Much depends upon the specific nature of the particular beast with which we are dealing.

Generally, when we are analyzing jobs in a closely integrated, multi-job organization with overall organizational goals, we will analyze purposes first. For instance, if we were analyzing a job or jobs in a combat infantry platoon, we would begin by identifying the general missions which the platoon may be required to perform. Each mission would be analyzed by means of rational processes into successively more detailed subordinate purposes until we reached a level in which a purpose can be performed by a single individual. This is the level of job duties.

However, when we are analyzing jobs that are not integrated into a multi-job organization, we may analyze situations first, rather than purposes. An outstanding example of this type of analysis has been conducted by McKnight [1]: it is concerned with driving a private automobile. In their words, the "first step in the process was to identify those aspects of the (highway transportation) system that were capable of creating situations to which the driver must respond-for example, curves in the road, traffic control devices, cars ahead, snow, rain, and driver fatigue. Over 1,000 specific behaviorally relevant system characteristics were identified."

---

[1] McKnight, A. James and Bert B. Adams, Driver Education Task Analysis: Task Analysis Methods, Technical Report 72-13, HumRRO, April 1972.

These system characteristics were then taken singly and in combination wi h each other to identify potential critical situations with which a driver may have to cope.

In order to identify the specific purposes and situations which constitute a given job, we begin by analyzing the system in which that job occurs. This initial systems analysis in the system engineering process is concerned with insuring the comprehensiveness and validity of the task inventory. With regard to the identification of system characteristics, McKnight and Adams note:

> Inasmuch as this activity formed the foundation for later analysis, particular pains were taken to see that the analysis was very broad, since to overlook any relevant system characteristics could result in the omission of potentially critical . . . behaviors.

They began both the situation analysis and the purpose analysis by identifying a restricted number of broadly defined classes of characteristics "which shape the responses the individual must make as a driver;" that is, "that might impose behavioral requirements upon the driver." The broad classes of characteristics from which the situation analysis commenced consisted of driver characteristics, vehicle characteristics, roadway characteristics, traffic characteristics, and characteristics of the external environment. These general characteristics guided the identification of specific characteristics gleaned from various sources of information. The initial list of characteristics was arranged into a logical hierarchy or tree-structure, or outline. This hierarchy was examined for logical gaps at each level. The gaps were filled in and in this manner the hierarchy was extended so as to be as comprehensive as possible. Parts of the final hierarchy has as many as seven levels. These situation characteristics were then taken singly and in combination to define the situations with which the subsequent analysis would be concerned.

McKnight and Adams also conducted an analysis of the system's purposes or goals. It was not nearly as elegant as the situation analysis, but it was equally important. As they defined it, the purpose or goal of the highway transportation system is to assure

"the movement of passengers and material from one place to
another with safety, efficiency, comfort, and responsibility."
The characteristics of the goal impose general behavioral require-
ments on drivers:

1. "Safety requires that drivers behave in a way that will
minimize the chances of injury or property damage..."

2. "Efficiency requires that drivers avoid interfering with
the rapid and economical flow of traffic..."

3. "Comfort requires that drivers operate in ways that will
not cause discomfort to passengers, other drivers, or pedestrains.."

4. "Responsibility means that drivers should be morally and
financially responsible for the consequences of their acts..."

Although the authors do not directly say so, it seems apparent that
these general goal characteristics must have been used to identify
specific goals or purposes in each situation defined by the situation
analysis. These specific goals defined what the effects of the driver's
behavior ought to be in the situation. Then the analysis probably
proceeded backwards from the necessary effects of the behavior to
the identification of the behavior itself. This analysis was based on the
operational characteristics and principles of automobiles.

The Analysis of a "Soft Skill"

We can specify what a machine operator ought to do if we know the
situations or environments in which he works, the purposes of his
work in these situations, and the theories of operation of the machines
he uses. Now suppose we were dealing with a supervisor or a leader
or a counselor. He is not a machine operator; rather, he is a people
operator. He directs the activities of people toward the accomplish-
ment of specified purposes in specified situations. However, he must
perform under a handicap not imposed on machine operators: namely,
his job activities have been only vaguely identified and have not been
derived from an unequivocal theory of operation for people. As a
result, supervisors tend to seek out or develop their own theory of
people operation from which they derive their job activities or else

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the accept the common myths about the operation of people which
are promulgated by our culture.

The selection of an appropriate theory of people operation is a task
for the behavioral scientist. But even among such experts, we will
find disagreements and myths. It is an area fraught with the vagaries
of ill-defined terms, which must be hacked through with a semantic
machete. I personally prefer to deal with leadership and motivation
job functions in terms of principles of behavior modification, some-
times also referred to as contingency management, behavior manage-
ment, reinforcement theory, or operant conditioning. I recommend
this approach for a number of reasons:

    1.   The basic principles are relatively simple and easy to learn
and, yet, have application to a great variety of situations.

    2.   Like systems engineering, it is a behavioral approach which
deals with specifically defined behaviors.

    3.   It leads to the development of precision management processes
in which behavior is monitored and progress is audited towards clearly
specified goals. This process provides a basis for a continual assess-
ment of effectiveness and for timely and flexible corrective action.

    4.   It provides effective and sophisticated alternatives to
intimidation, punishment, and permissiveness as general motivational
and disciplinary treatments.

I'm not going to subject you to a treatise on behavior modification
at this time. There are a number of excellent publications on the
topic, some of which are listed on your handouts (Appendix C).

Although behavior modification principles constitute an appropriate
theory of people operation for leadership and motivation job functions,
other human job functions will involve other theories of people operation.
For instance, if we were dealing with target recognition, we would
select an appropriate visual perception theory. If we were dealing
with complex job decisions, we would select an appropriate decision-
making theory.

Now let's look at "worker motivation" as a job function. We begin by analyzing the term "worker motivation" into the kinds of behaviors exhibited by motivated workers. What does the motivated worker do that makes him different from the unmotivated worker? I have listed some suggested operational characteristics of a "motivated worker" in your handout. Clearly, a "motivated worker" should perform some adequate amount of work that leads to the attainment of organizational goals. He should exhibit a low frequency of interference with other workers. He should coordinate his work with others in keeping with organizational goals. If necessary, he should help others to perform their work, if he is able to do so. He should minimize the effects of outside disruptions on his own work and that of others. And we might also want him to choose the organization for his work career.

These operational characteristics constitute the effects which we wish to bring about in our workers. In this regard, I strongly recommend Bob Mager's recent book, Goal Analysis,* as a guide for learning how to analyze such fuzzy terms as "motivated worker" into a set of operational characteristics.

Once we have listed the effects or purposes we wish to achieve in operational terms, then we need to select one or more suitable theories of operation from which we can determine what has to be done in order to achieve these effects. A behavior modification approach accounts for behavior in terms of conditions in the environment in which the behavior occurs. The most important environmental conditions consist of the manner in which other people respond to the worker's behavior. In this instance, these other people consist of his supervisor and his fellow workers. Whether or not a worker behaves in a "motivated" fashion depends largely on how other people in his work environment treat him. And how others treat him depends to some extent upon how he treats them.

Our problem, as systems engineers, is to design a behavior system in which people interact in such a way as to enhance each other's work behavior. We need to determine the critical interpersonal behaviors required from the supervisor, from other workers, and from the worker himself, in order to optimize the worker's job performance. The inter-personal behaviors of both the supervisor and of the other workers should accomplish the same general functions;

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*See suggested readings (Appendix C)

that is, they need to reinforce the worker for appropriate behavior, refi_ in from reinforcing him for inappropriate behavior, and minimize aversive stimuli in his environment. The specific ways in which they go about performing these functions will differ.

If you will look at your handouts, you will find a statement of the supervisor's functions in behavioral terms and an analysis of the purposes which make up this function. Again, both the statement and the purposes are based on behavior modification principles as the underlying theory of operation. The statement names the acts the supervisor is to perform--he designs and implements management practices. And it names the effects such acts are to have on the behavior of the people he manages--strengthen their productive behaviors and weaken their counter-productive behaviors. In order to achieve these effects, the supervisor must achieve three major purposes or tasks:

1. He must appropriately reinforce productive behaviors.

2. He must minimize the inadvertant reinforcement of counter-productive behaviors.

3. He must minimize aversive conditions in the environment.

Each of these purposes can be analyzed into subordinate purposes. For instance, in order to reinforce productive behavior, the supervisor must:

1. identify and define it,

2. monitor it,

3. identify reinforcers,

4. administer the reinforcers, and

5. modify the reinforcement program, if necessary, to maintain or increase the frequency of productive behaviors.

The other two major purposes have been analyzed in a similar fashion.

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The overall statement and its analysis into different levels of
purposes constitutes a behavioral model for prescribing certain
supervisor or leader activities at all levels of virtually any
organization. The situations in which these purposes are sought,
however, will be different in different organizations and at different
levels in those organizations. In order to complete the analysis,
we need to identify the situations in which these purposes are to be
attained. For the kinds of people who inhabit the particular levels
of the particular organizations in which we are interested, we need
answers to the following kinds of questions:

    1. What kinds of productive behaviors are required? What
kinds of things must subordinates do in order to attain the organiza-
tion's goals?

    2. Which of these productive behaviors typically occur with
insufficient frequency?

    3. What kinds of events are most effective as reinforcers?
Quite often the most effective reinforcers are inter-personal
expressions of approval. But oftentimes supervisors attend to
their subordinates only to chastise them.

    4. What techniques can be used to administer the reinforcers
effectively? Often the supervisor will have to be trained to say more
approving and fewer disapproving things to his subordinates.

    5. What kinds of counter-productive behaviors typically occur?
Subordinates may fail to report work difficulties such as equipment
malfunctions, or subordinates may actually sabotage each other's
efforts.

    6. What kinds of events typically maintain these counter-
productive behaviors? Oftentimes, common management practices
actually reinforce counter-productive behavior. Supervisors often
chastise subordinates for reporting work difficulties. And often
they administer incentives such as pay and promotion on a competitive
basis, and then chastise their subordinates for not behaving
cooperatively.

7. What kinds of techniques can be used to minimize the occurrence of the various counter-productive or disruptive behaviors? For instance, we may have to change traditional incentive systems.

8. What kinds of techniques can be used to monitor the occurrence of productive and counter-productive behaviors? If you can't observe it and record it, you can't manage it.

9. What are the typical aversive conditions found at this level of the organization? We want to minimize aversive conditions because they elicit avoidance, escape, and agressive behaviors.

10. What kinds of techniques can be used to minimize the inadvertant reinforcement of counter-productive behaviors and the occurrence of aversive events? For instance, if we judged "midnight requisitioning" of supplies to be counter-productive, we would probably have to change the consequences of military inspections from fixing blame to providing help without blame. As long as the consequences of inspection can be aversive to people's careers, there will be cheating to avoid those consequences.

We will get different answers to these questions if our interest is in a battalion staff rather than in an infantry squad. In either case, the answers can only be obtained through the conduct of field studies using interviews, questionnaires, direct observation, and trial applications. Note, however, that these field studies do not validate our model. They elaborate it. The model itself is valid to the extent that our theory of people operation and our information gathering processes are valid. In this case, our theory of people operation consists of the principles of behavior modification. Note also that the entries in the model are not independent. Although the entries in the lowest level of the model look somewhat like a conventional task inventory, you can't pick and choose from among them. They must be either accepted or rejected as a total package. And, finally, note that the model consists of several levels, rather than just one as does the typical task inventory. This allows us to avoid the racking problem of selecting a single level at which to write all our tasks. Instead, different branches of our hierarchy can be analyzed to different levels, depending upon our differing states of knowledge. To complete the overall model, we would need to conduct similar analysis for the roles of the other workers and for the worker himself.

Similarities in the Analysis of "Hard" and "Soft" Skills

It makes no difference whether we are dealing with "hard" or "soft" skills, the general systems engineering process should be the same.

1. We identify the purposes or goals of the system. In doing so, we begin with very broad purposes and analyze these broad purposes into successively more detailed purposes until we reach a level at which they can be allocated to individual workers. Equipment designers do some of this kind of analysis, but the systems engineer will generally need to do an additional analysis. If the system doesn't contain any significant equipment, then the systems engineer will have to conduct the purpose analysis in toto.

2. We identify a suitable theory of operation for the equipment or people with which our workers will interact. The theory must be appropriate to the function the worker is to perform on the equipment or people. Sometimes the worker will perform the function on himself rather than on someone else. For instance, target recognition and individual decision making are self operations. The application of the theory of operation to the general analysis of a gross purpose or job function results in the development of a behavioral model of the job function.

3. We identify the characteristics of the situation in which the worker will operate and which shape the responses he must make. Oftentimes, our theory of operation will guide us in the selection of appropriate situation characteristics. If we're dealing with a maintenance job, we'll want to identify routine maintenance schedules and malfunction and symptom information. If we're dealing with supervisory jobs, we'll want to identify actual reinforcing and aversive events.

4. We apply our theory or theories of operation to determine what actions our worker ought to take in order to attain the appropriate purposes in specified situations. If we're dealing with a maintenance job, we may conduct a trouble-shooting analysis. If we're dealing with a supervisory job, we will conduct a behavioral analysis.

The systems engineering process is not a fixed procedure to be administered in a stepwise fashion. We frequently learn something in a later stage that will cause us to revise an analysis done in an earlier stage. And, frequently, we will find glaring and unsuspected gaps in the system or job that we're analyzing.

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When finished, we will have established the relationship between the job and the purposes of the organization; we will have identified a theory of operation for the equipment our worker will use, whether that equipment be mechanical or human; we will have identified the specific purposes a worker must attain, the probable situations in which the purposes will need to be attained, and the actions required to attain these purposes in these situations. We will then be in a position to design job sample practice and testing procedures. If it's a maintenance job, we may have students troubleshoot a malfunction inserted in the equipment. If it's a supervisory job, we may have them attempt to solve a work motivation problem in a role playing situation. Instead of inundating students with information about troubleshooting or about leadership, we'll have them practice specific troubleshooting or leadership skills in simulated job situations. In the spirit of the term, but not its literal meaning, it's still "hands-on" instruction regardless of whether it's a "hard" or a "soft" skill.

SYSTEMS ENGINEERING OF SOFT SKILL COURSES

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II-21

My task this morning is to present a summary of how systems engineering soft skills was applied to the Advance Chaplains Course at the Army Chaplain School. When Dr. Cruse first gave me a call on this topic, I was reminded of the sermon title of a new seminary graduate shortly after ordination when he announced to his congregation that his sermon title for the morning was: "A Brief Look at The Past, Present, and Future of God, Man, and the Universe."

I will try not to be intimidated by following Dr. Mager and the HUMRRO presentation. Perhaps you'll be disappointed that this is not going to be much of a head trip that I'm taking you on but I will try to show you what we did and how we did it at the Chaplain School. Deductions, conversation, and perhaps criticism as to the way we did it can take place this afternoon.

Two over-riding considerations that we had in our approach to the systems engineering of a soft skill course were: What do we want the graduate student to be able to perform, and concurrently, what type of person do we want the graduate to be?

We are all familiar with the seven steps of the systems engineering process as they appear in the CONARC regulation. Dr. Cruse indicated that the concern here this morning is with the first 2-1/2 steps of that process, taking us through an approach to the writing of performance objectives for soft skill training.

SLIDE 1

SYSTEMS ENGINEERING

1. Perform Job Analysis
2. Select Tasks for Training
3. Prepare Training Analysis
4. Develop Training Materials
5. Develop Evaluation Instruments
6. Conduct Training
7. Exercise Quality Control

The initial work on the C22 course began in late 1970 - late calendar year 1970, and the systems engineered course implemented in September 1971. For illustrative purposes, I will occasionally be following through an example task from the genesis of its identification

to its current utilization in the C22 program. The general CONARC
procedures were followed in the Job Analysis step of the systems
engineering process.

SLIDE 2

Perform   Job
                 Analysis

As we sought to identify on-the-job tasks that Advance Course Chaplain
graduates were expected to perform, we investigated both official and
unofficial sources of information in order to identify and isolate chaplain
tasks.

SLIDE 3

SOURCES OF JOB INFORMATION

1. Army Regulations
2. Field Manuals
3. Technical Manuals
4. Directives from the Office Chief of Chaplains
5. Experienced Job Holders
6. MODB

Among these sources of information were included AR 165-20 entitled
"Duties of Chaplains and Commander's Responsibilities"; FM 16-5
entitled "The Chaplain"; various technical manuals; various directives
from the Office of the Chief of Chaplains, particularly the publication
entitled The Five Year Program. Another prime source of information
was experienced job holders serving on the staff and faculty of the
Chaplain School. The MODB for MOS 71M20 was also used. I'll have
more to say about our use of the MODB a bit later.

These sources contributed to the development of our task inventory.
The development of the task inventory was the initial block to be over-
come. As was pointed out in the earlier presentations, the identifica-
tion of tasks, or the listing and description of tasks to be performed in
the soft skill area, is rather diverse and imprecise. So the development
of a task inventory was the initial significant step in the process.

For example purposes, one chaplain task required by law is found in FM 16-5.

SLIDE 4

FM 16-5
SOURCE OF JOB INFORMATION

Chapter 4, paragraph 2a. "The Chaplain is required by law to conduct appropriate public religious services for the command to which he is assigned."

The chaplain is required by law to conduct appropriate public religious services for the command to which he is assigned. Consequently, this requirement was included in the task inventory. Due to the unique job relationship existing between the chaplain and his assistant, the 71M enlisted assistant, the MODB was screened in order to determine task areas from which chaplain tasks might be deduced. Now I recognize that the use of an MODB for a task inventory development for an officers career course might be somewhat suspect. However, since the tasks of the chaplain enlisted assistant, cast in the hard skill area, generally have to do with manual tasks in relationship to a chaplain task, we felt the use of the MODB was valid for the interpretive purposes for which we intended it. Therefore, through this process, we isolated and deduced soft skill chaplain tasks from the 71M MODB. By intensive screening and analysis of official and unofficial sources of information, a task inventory of 3 major functional areas, 21 tasks groups, 86 major duties and 476 specific chaplain tasks were identified.

SLIDE 5

CATEGORIES OF TASK INVENTORY

Functional Areas	3
Task Groups	21
Duties	86
Tasks	476

We defined functional areas as groups of related chaplain functions supported by common references such as military publications. A task group consists of a related cluster of duties that have similar task and task elements and may be identified as an area of work within a particular duty assignment. A duty is a prescribed activity in which a chaplain may be required to participate. Finally, we thought of a task as the specific action taken by an individual chaplain in performing a duty.

From this task inventory, a survey instrument was developed for use in the field validation of this task list. Surveys were mailed to over 100 unit chaplains covering the entire range of rank and duty assignments. In addition to the mailed surveys, we desired to conduct on-site at 4 different installations. In most cases, the Commanders of those chaplains were also interviewed reference the tasks of their assigned chaplains. Care was exercised in order to include general chaplain assignments as well as specialized assignments, such as hospital chaplains, confinement facility chaplains, and chaplains serving on drug and alcohol abuse teams.

Based on these surveys and interview findings, 74 tasks were selected for school training from the total of 476 tasks identified.

SLIDE 6

TASK SELECTION

Total Tasks	476
Tasks Selected for School Training	74

If we continue using our example in the area of conducting religious services, 9 tasks were approved and selected for school training out of a total of 33 tasks for the conduct of religious service areas.

SLIDE 7

TASKS RELATING TO
CONDUCTING RELIGIOUS SERVICES

Total 33
Selected for School Training   9

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The selection of tasks for training was performed at the Chaplain School by an Ad Hoc Systems Engineering Committee. This Committee was composed of representatives of the Office of Director of Instruction (Curriculum and Evaluation and Methods), the Education Advisor, and members of the staff and faculty. Selections were made on the basis of the standard regulatory criteria. But a key tool used in the selection process was the completed task validation form, an example of which is shown here.

SLIDE 8 (Appendix D)

In order to transform the tasks selected for school training into training objectives, the resident faculty was organized into committees corresponding to the three major functional groupings of tasks selected. I might add at this point of the systems engineering process, as we identified the three major functional areas, the Chaplain School Resident Department was restructured to align itself with these three functional areas. These three functional groupings were the pastoral activities, management, and the military operations and organization areas.

Each functional group of selected task was presented to the corresponding committee whose responsibility it was to develop the training objective. Through this committee effort, we directly involved the faculty in the systems engineering process, thereby providing an opportunity for intellectual and ego investment on the part of the Faculty into the systems engineering effort.

Again, by way of illustration, using our "conduct religious services" task model, while translating the selected tasks for school training into training objectives, we see progress from a task identified in a field manual, "the chaplain is required by law to conduct appropriate public religious services for the command to which he is assigned" to seven performance objectives selected and approved for school training.

SLIDE 9

TITLES OF TRAINING OBJECTIVES RELATING TO
CONDUCTING RELIGIOUS SERVICES

22020	Research current literature for sermons, homilies, and meditations
22021	Employ/Support others in employing new forms of worship
22022	Provides for the administration of sacraments and rites
22023	Provide lay participation in worship
22024	Provide opportunity to meet Jewish Holy Day requirements
22025	Provide interfaith worship opportunities
22026	Provide worship opportunities for Non Judaeo-Christian Groups

These seven objectives were developed out of this one task identified in the field manual.

We have learned several things from this exercise in systems engineering of soft skill training at the Chaplain School.

SLIDE 10

LESSONS LEARNED

1. Dealing with attitudes
2. Faculty resistance
3. Level of specificity
4. Student Centered Instruction

Basically, for summary purposes, four major lessons learned areas are those relating to the problem of dealing with attitudes, staff and faculty resistance, the matter of determining the proper level of specificity of training objectives, and the area of student-centered instruction.

It is to plow old ground to say there is difficulty involved in teaching an attitude. When an attitude was identified in the systems engineering process, the task of teaching that attitude or rather changing behavior to conform to that attitude, presented the usual problems. We found that as the small group was the optimal means for task analysis, task selection, and for the writing of objectives; so also, we found small groups to be the best means available to deal with the matter of attitudes.

In the area of staff and faculty resistance, academic inertia and resistance to change was as prevalent at the Chaplain School as at nearly any other military or civilian educational institution. We might say that resistance to change is randomly distributed in the educational community. As the task selection committee met, their orientation to the subjective element within the systems engineering process (by subjective elements within the systems engineering process I mean those experiences that the job holders themselves were able to bring in to the systems engineering process) relieved much of the initial resistance. I don't want to get too deeply involved into the etiology of the resistance but part of it was based on the impression, or the lack of clear definition or impression, of what the systems engineering process was as it related to the soft skill area. It was somehow perceived as a totally impersonal, objective process which either devalued or did not take into account the accumulated professional experience of the members of the staff and faculty themselves. When they saw the possibility of their own input and the increased possibility of student feedback, much of the initial faculty resistance was overcome.

During the first writing of training objectives we found that we had written the objectives at too exact or too high a level of specificity. For example, seven objectives were initially developed in the worship area from the selected task of "conduct of religious services," and each objective was taught as a discrete block of instruction. Both students and faculty recognized that these seven objectives should be incorporated into one objective, which has been utilized to construct the current block of instruction. I would like to, at this time, distribute this particular objective as written. An objective on religious coverage will also be distributed. *

*Handouts are available upon request from the
 US Army Chaplain School

These objectives, as you later look at them, will lead you to the fourth area of our "lessons learned," and that is the area of student centered instruction. Our career class has been organized into eight learning groups of twelve students and one faculty advisor. It is the current practice at the Chaplain School to have the primary instructor prepare the training objective within the format of the performance actions, conditions and standards. This training objective is then presented to a board consisting of the eight student faculty advisors. This board of faculty advisors serves as a type "murder board" and is permitted to modify the objective. This objective then is presented to the students. At the time of presentation, the students are also free to modify the means of achieving the objective. They cannot modify the terminal required performance actions and standards, but latitude is given to the students to modify the means of achieving that performance action. Through these modification procedures, we are thus attempting to have the systems engineering process opened to immediate feedback and we are also seeking to have an immediate feedback procedure as part of the learning environment within the classroom setting itself.

We are currently conducting our second systems engineered career course. The class last year assisted in the re-engineering process of the first class and we expect the class this year will serve a similar function. To say that the class last year assisted in modification and that we intend to do the same this year, suggests that we don't feel satisfied that we have found all the answers to all the problems. This is true. We recognize it and we feel it is "O-K" since we regard systems engineering of instruction, particularly soft skill instruction, as an on-going continuing, dynamic process.

This, in short, has been what we did at the Chaplain School, and hopefully gave you a bit of a look at how we did it. Thank you.

A FUNCTIONAL APPROACH IN DESIGN OF
SOFT SKILL TRAINING

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One of the most trying problems in attempting to design Officer and NCO professional development courses is encountered in identifying just exactly what we are trying to teach students to DO. Every approach tends to come to the same point: instead of teaching them to DO, we are trying to teach them to BE something -- military leaders and managers -- and the many things they DO as leaders and managers depends upon the circumstances of the particular situation. It would seem more realistic, then, to focus on the common functions of management and leadership, rather than try to predict precisely which tasks a manager or leader would be most likely to perform and under what particular set of circumstances.

I would like to present a cybernetic model of management as one approach to identifying the functions of management/leadership. A manager is seen as the controller of a system. This system can be at any level of complexity -- from one person with one task to many people with many complex functions. A system equates roughly to a job for purposes of discussion. An example of a cybernetic system is shown in Appendix E. In this model, there are four main parts: (1) the controller (manager); (2) the methods and means; (3) the goals (outputs); (4) the feedback system, which tells the controller the effects of the action taken. In using the model it is highly important to consider the relationships of one system to another (interfaces) and the constraints or limitations which apply to any given system.

Using the suggested approach in systems engineering soft-skill training courses for managers, it would be necessary to determine the functions of the controller of our model system and identify the skills and knowledges needed by the controller to perform these functions. The functions of the system controller in this model would be to: (1) learn the goals of that particular system; (2) establish the communications required to activate and control the system and to receive the necessary feedback in a useful time frame; (3) direct the methods and means necessary to accomplish the goals; and (4) establish procedures whereby the system can operate efficiently.

Skills needed by the controller to perform the functions of our model system are ability to make decisions, plan, organize, define, and evaluate situations; set priorities; properly utilize resources; exercise judgment in initiating and stopping actions; evaluate actions taken in

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terms of the systems' goals; set standards; and maintain the discipline of the system. Knowledge needed to perform the functions of the system include knowledge of interface relationships, procedures, tools, and constraints of the system.

In general, there seem to be three major areas of management expertise involved in efficiently controlling a system: (1) management of people (leadership); (2) knowledge of the processes, procedures, and tools involved; (3) technical knowledge. Major areas 1 and 2 above will be common to every job an Officer or NCO holds throughout his career; therefore, it would seem that these are the two areas which should be taught in professional development courses.

An advantage of such an approach would be to change the nature of the Officer/NCO self-image. An experiment which I conducted with some newly graduated Officer Basic Course Students showed that they did not have any idea what their responsibilities would be when they reached their new assignments. Typical answers to the question, "What are you going to do first when you get to your new duty station?" were "I don't know" and "It will depend on what job I end up with." If they had thought of themselves as managers of a system, representative answers might well have been "I will really be busy. I have to learn what my job is; what resources I have available; all about the people I'll be working with; what the parameters of my job are; what my interfaces are; what kind of communications system I'll need to keep things moving; and what procedures and tools are used in varying situations".

One of the goals of such functionally-oriented training would be to permit students to demonstrate their skills of management, rather than have them read and state the principles of management and hope that they could apply the principles properly in future assignments. The problem of qualifying officer and NCOs in specific skill areas should be accomplished by MOS courses, correspondence courses, and OJT as it presently is, thus allowing the professional development courses to concentrate on the skills and knowledges of management and leadership. These courses should provide practice in skills such as decision-making, organizing, initiating and evaluating actions, and other managerial functions; they should also teach him how to determine what he needs to know to effectively undertake the responsibilities of a new job.

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In general, the student would see himself as a manager -- a decision-maker -- and as the director or "controller" of a system. He would know that he must understand the system he is to direct. He would know that he must learn its boundaries, its limitations, and its interface with other systems. He would know that he must learn the goals of the system, the methods and means available to him for accomplishing those goals, and the communications channels and processes required to keep the system functioning smoothly.

SYSTEMS ENGINEERING OF THE ORDNANCE
OFFICER ADVANCED COURSE

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In November 1970, the Ordnance School began a resystems engineering of the Ordnance Officer Advance Course. This course was originally systems engineered during 1966-67 when we converted from a six to a nine month course to comply with the Haines Board recommendations. The revision was accomplished in minimal time, and at a time when all personnel were not familiar or comfortable with the new Systems Approach to course design. As a result, many staff and faculty seriously questioned the validity of the content of the new course. Many minor revisions were made in individual subject areas, based on feedback, during the subsequent 3 year period, yet this concern persisted.

Presently we are putting the finishing touches on the training analysis step of the new course. Progress has been sporadic due to personnel shortages, workload, and other higher priority tasks. We have now, however, given this effort increased emphasis and have established relatively firm target dates for future steps and hope to have the draft POI not later than the end of this fiscal year. While we believe we have done a good job so far, we must now speed up the action because time is taking its toll. This is particularly critical in that turn over of personnel is causing difficulty in maintaining continuity of effort. To accomplish systems engineering of the advance course, the Command and Staff Training Department designated a full time project officer - An experienced LTC of ordnance. Working with the department director, his assistant and other key personnel, the project officer approached job analysis, the most difficult systems step, from the standpoint of strategy. Unlike an officer or enlisted MOS course, we could not simply study the MOS descriptions, the various duty assignments and job performed to derive a task inventory. Rather, we were faced with the course purpose shown here:

SLIDE 1

PURPOSE OF ADVANCED COURSE

"To prepare ordnance officers for command and staff duties at battalion through brigade or comparable levels in both divisional and nondivisional units, with emphasis on the exercise of command at battalion level, <u>and to perform integrated materiel management duties appropriate for field grade officer positions, with emphasis on assignments within the CONUS Industrial Mobilization Base.</u>"

The first part of the purpose you will recognize as the standard CONARC statement for an advance course. The underlined portion was added by our Commandant to direct our efforts. We must prepare the Ordnance Officer for a wide variety of jobs, to include AMC-DSA type assignments, because the advanced course is the last ordnance oriented course he will attend in his career.

This purpose leads directly to no single MOS. Rather, course intelligence supplied by OPO showed that 2300 assignments of Ordnance Officers in grades of major thru colonel reflected approximately 88 different MOS's. The implied purpose of the advance course is to provide a broad educational base for all future branch assignments. We therefore concluded that we must design a course to prepare the student for the most frequent or typical assignments and would have to ignore many MOS areas.

A thorough review of assignments led to the selection of eight MOS's which then became the basis for all subsequent efforts. Those MOS's are shown here:

SLIDE 2

MAJOR ASSIGNMENT AREAS

MOS 2162	Operations Officer
MOS 2167	R&D Coordinator
MOS 4010	Supply Staff Officer
MOS 4011	Maintenance Staff Officer
MOS 4319	Procurement Control and Production Officer
MOS 4320	Procurement Officer
MOS 4515	Missile and Munitions Officer
MOS 4803	Maintenance Officer

These MOS's were determined to cover the vast majority of all ordnance officer assignments and had many duties common to most of the 80 not included.

At this point a systems engineering committee was appointed consisting of the previously mentioned project officer as chairman, his alternate, and 6 field grade officers with MOS's and experience in the above areas. These officers, all from C&STD, have since functioned on a part time

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basis. Consideration was given to making this a full time duty to speed up the effort, however, present and projected resources were such that it was not practical to pull this many key people from their primary duties as branch chiefs and instructors. In addition, the department director, his civilian assistant, and the senior ordnance LTC in the department acted as a review board, reviewing and approving accomplishments of the committee.

The systems engineer committee then prepared the task inventory - developing a separate task list for each MOS area. Redundancy was immediately recognized in this approach. Therefore, tasks dealing with things such as unit and personnel administration, tasks common to all MOS's were included in only one of the MOS task lists.

A major difficulty arose concerning the level of specificity of task identification. I will show some examples later, but will now discuss the problem in rather general terms. In some areas such as the hard core ordnance areas of supply and maintenance, we found it rather easy to develop a detailed task inventory; one in which there was a high degree of agreement regarding the validity of the inventory. In many respects the job analysis for these areas was very similar to that for hard skill officer courses such as the Ordnance Officer Maintenance Course, MOS 4815. Some examples of these tasks are, approve/disapprove quarterly reports of operation loss or breakage, maintain hand receipt files, and maintain organizational document registers.

In the R&D and procurement areas we faced a difference situation. Initially, we were not able to identify the tasks with any great degree of detail. For example, we included many tasks that contained the action verbs "supervise", "monitor", and "manage". When we attempted to identify what an officer does when he supervises and manages, we found a high degree of variability from position to position and from task to task. Let me illustrate. The task Supervise Civilian Personnel varies along many dimensions such as the grade range of the civilians, their category, i.e., GS or wage grade, and professional standing. This is an example where everyone that has supervised civilians will have many experiences to contribute. Reaching a consensus with respect to the relevant and significant variables is not easy. This is where we encountered the greatest difference between hard skill and soft skill areas. In general, our approach has been to accept initially

a rather general task statement and then proceed to more detailed behaviors much the same as we do when identifying skills and knowl- edges for hard skill tasks. This suggests to us that in the truly soft skill areas, maybe it is the skills and knowledges that become the real training requirements. When they are integrated in actual practice such tasks or concepts as "supervise" or "manage" emerge. Here, I am suggesting an approach in which the whole is greater than the sum of its parts.

We can teach an officer to prepare a staff study and to analyze reports for deficiencies and clues to needed actions, but such tasks as supervise and manage, leave room for uncertainty. We start with such tasks and proceed to break them into their component elements. An example from the R&D coordinator was the task Monitor Design Activities. We then specifically broke this down into things like: Prepare Memoranda Indicating Design Status; Make Recommendations Relative to Design Concept, etc.

During the second step of system engineering, Selecting Tasks for Training, we encountered certain different considerations. In the areas of maintenance and supply, we were able to select tasks in a manner similar to that which had been used with hard skill courses. Since the tasks were rather specific, we encountered no major difficul- ties and our selection criteria were basically as stated in CON Reg 350-100-1.

In the R&D and procurement areas we found it necessary to change the rationale for task selection. The major reason being that many officers will receive additional training prior to assignments in these areas such as the Project Manager Course at Ft. Belvior, VA. In this case we found that our primary interest was more one of sampling in a general way the more numerous R&D and procurement tasks. In this manner, we hope to provide a broad foundation that will serve as a useful base on which to build specific performance capabilities. The point I wish to emphasize is that selecting tasks for training in soft skill areas requires that more thought be given to the underlying philosophy of task selection. In hard skills this philosophy seems to remain rather constant and the list of specific criteria can be followed rather routinely. With soft skills, this underlying philosophy must be re-examined as the selection process moves from area to area, and the overall objective in each area must always be visible.

Despite efforts previously mentioned to minimize redundancy, our approach revealed considerable repetition of tasks among MOS areas. Of more than 2,000 tasks originally identified, we selected 1,039 for training. To these tasks we added those CONARC-DA Essential Training Subjects not included in our task inventory and gave consideration to CONARC-DA Selected Training Subjects for appropriateness in our course. Here again the inventory was reviewed and approved.

The next step in systems engineering, training analysis, has proved to be the most laborious, if not the most difficult step thus far encountered. The information gathered in the task inventory led directly to the identification of supporting skills, knowledges, and job significant attitudes. To assist administratively, job standards and job condition codes were established for each MOS.

Developing training objectives and evaluation criteria is another matter. As many of you know, writing a useful, three-part training objective with task, condition, and standard is not easy.

Several factors contribute to this difficulty. Some of the more significant ones are:

1. People require intensive training and practice in writing behaviorally oriented training objectives. It doesn't come naturally.

2. Inadequacies may appear in the job analysis. These include insufficient information and inappropriately defined task statements.

3. Coordination and correlation with various groups is essential to insure agreement on identified common elements. This is particularly difficult to accomplish with a high turnover of personnel.

Now I will provide examples of objectives that sample the spectrum that I have been describing.

One of the simpler tasks in taken from the MOS 4011 Maintenance Staff Officer inventory dealing with supply procedures. The task being simply:

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SLIDE 3

TASK

Approves/Disapproves Reports of Survey

OBJECTIVE

In a classroom environment the student will review and
approve or disapprove reports of survey. Reports will
be evaluated against criteria contained in AR's 710-2,
735-10, and 735-11. Specific deficiencies will be listed
and students will approve, approve with minor modifi-
cations, or disapprove.

The training objective developed for this task is basically straight
forward requiring the student to actually review reports of survey
and decide for, or against approval based upon army regulations.

Once we identified the task to this level, the training objective was
not too difficult. However, I wish to emphasize that this task is part
of a larger requirement of supervising unit supply procedures. If
we compare to hard skill courses, we might say this is a skill and
knowledge that is common to many job requirements. This broad
spectrum requirement is satisfied by that portion of the objective
which specifies both garrison and field conditions.

The next slide illustrates a slightly more complex task.

SLIDE 4

TASK

Supervise the Operation of Automatic Supply

OBJECTIVE

In a command post exercise environment using doctrine
published in AR 710-1 and 2, the student will analyze
reports of activity supply operations and will identify
deficiencies and recommend corrective action.

This objective is of particular interest because we were able to redefine Supervise Operations of Automatic Supply as Analyze Operations, Identify Deficiencies and Recommend Corrective Actions if required. We recognize that other actions are necessary such as Developing Automatic Supply Procedures, but such requirements are provided for as part of other objectives.

The next task was taken from the missile and munition inventory, but could come from most any duty MOS dealing with management of personnel within an organization. This task is broader than the first two.

SLIDE 5

TASK

Manage Organization Personnel

OBJECTIVE

In a classroom environment, the student will review personnel records, recommend assignments, and evaluate performance of organizational personnel. Standards of acceptable performance are contained in AR's 600-200, 600-8, 600-16, 600-20, 611-1, 614-1, 611-15, 60-21, 612-200, and 230-2, and simulated local SOP's.

Using approved DA publications, we break down "manage" into Reviewing Records, Recommending Assignments, and Evaluating Organizational Personnel. Again, not all implied subtasks are involved, those not covered in this objective are covered in others.

The last task we will discuss is from R&D area:

TASK

Make Recommendations for Entry Into Engineering
Development or Contract Definition

OBJECTIVE

In a classroom environment the student will develop an outline
plan which identifies the actions which must be completed before
a development project can move into Engineering Development
or Contract Definition (i.e., Concept Formulation through
approval of MN(ED) must be complete). Job Standards A thru
P apply.

This broad task encompasses many skills and knowledges relating to
the life cycle management of army materiel and status of R&D projects.
Here the student must develop an outline plan and identify the actions
which must be completed, before recommendations can be made to
enter into engineering development or contract definitions. In this
way, the general task Make Recommendation is reduced to a more
specific task or behavior.

While we do not consider the objectives you have just seen to be perfect
models for soft skill tasks, we do believe they are workable. While
not a part of this discussion, many of the problems encountered in
development of training objectives also occured when writing the
accompanying criterion statement. However, if the objective was well
stated this usually led to a good criterion statement.

Systems engineering of our advanced course has been a long laborious
task. We have learned much, not the least being a great deal about
systems engineering. Among the significant lessons learned are:

1. Serious Consideration should be given to forming a full time
committee. As stated earlier, we considered this but at the time
believed we could not afford it. Some now believe it may have been
less costly in the long run to have formed a full time committee.

2.   <u>Don't underestimate the need for training.</u> Many of our difficulties have been directly traceable to a lack of understanding of the system engineering process on the part of the people involved.

3.   Even though there are differences between hard skill and soft skill courses these differences do not preclude the use of the system engineering approach when developing soft skill courses.

In conclusion, while still not complete, we can see a new advanced course over the horizon. It may not be too radically different from our present course, but after this effort we will be more certain that it has the validity required to meet the needs of our ordnance officers in their future assignments.

SYSTEMS APPROACH IN DESIGNING COURSES
FOR EIGHT COMBAT MOS's

Lieutenant Colonel Mike Lyman
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II-44

Introduction. I am LTC Mike Lyman from the Infantry School, Fort Benning. I have been in charge of the systems engineering of resident courses during the past three years until July 1972. Currently, I have the Training Division of the Office of Doctrine Development Literature and Plans. I am in charge of the Infantry School systems engineering group that is performing the Combat Arms Training Board's Eight Combat MOS Study.

Purpose of Briefing.

SLIDE 1

PURPOSE OF BRIEFING

Discuss rationale for eight combat MOS study
Describe procedures and considerations used in
   systems engineering soft skill tasks

The general purpose of my briefing is to provide you some insight for the Eight Combat MOS Study, the procedures we are using and how we are handling soft skill systems engineering. More specifically, I will discuss rationale for the Eight Combat MOS Study and describe procedures and considerations used in system engineering soft skill tasks.

Concept of Eight Combat MOS Study. In August of this year the Combat Arms Training Board (CATB) decided to systems engineer two key MOS's from each of the four combat arms, Infantry, Armor, Artillery, and Air Defense. It was felt that there was a body of common tasks performed by personnel in each of these MOS's. The MOS's selected are shown in this slide.

SLIDE 2 (Appendix F)

Each school involved selected several duty positions from each MOS at the various skill levels through skill level "4" and commenced preparing a job identification as outlined in the CONARC regulation. For example, eleven duty positions in MOS 11B were selected. Each school then separately developed a task inventory for their two MOS's and cross-referenced them to a matrix containing the duty positions. In September the four schools got together and compared their listings. After a nine day session, the common tasks performed by at least one duty position in each of the eight MOS were identified and agreed upon. These tasks

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were called fundamentals and were categorized by common subject areas The remaining tasks were reorganized into branch and MOS specific tasks. Those classified as branch were those remaining tasks that were performed by at least one duty position in both MOS's of the branch. The remaining tasks were grouped by category into MOS specific tasks.

Common Categories. The categories having tasks that were common to all eight of the MOS are shown in this slide.

SLIDE 3 (Appendix G)

Although initially we had identified 43 categories, only the 28 shown were common to at least one duty position in all eight MOS. Following the meeting CATB designated certain of these common categories for development by selected combat arms schools. In many categories however, each school had branch and MOS specific tasks to develop. In addition several categories that were not common to all eight MOS were to be developed. Currently each school is developing Job Task Data for the common categories. Job Task Data as I'm sure most of you know consists of subtasks, job conditions and standards and the supporting skills, knowledges, and attitudes.

Sample Task Identification Matrix.

SLIDE 4 (Appendix H)

This slide shows a sample extract of the matrix we are using. The tasks as mentioned before are identified as either fundamental - that is common to all eight MOS, branch or MOS specific. A separate matrix for each MOS is identified with duty positions for each skill level listed. An "X" is placed in the matrix if the task is performed by the duty position. For MOS 11B we identified 11 duty positions, some of which are shown on this sample. Some tasks from the "CBR" category are listed. Of course the task list includes both soft skill and hard skill tasks. Prepare a CBR Plan is undoubtedly a soft skill task whereas the others are closer to being classified as hard skill.

Rationale for Eight Combat MOS Study.

SLIDE 5

RATIONALE FOR EIGHT COMBAT MOS STUDY

Prevent duplicative systems engineering efforts
Prepare consolidated training literature for job incumbents
Provide audio-visual lessons for continuation training in units
Provide diagnostic tests for individual skills
Provide "how-to-train" literature for unit leaders
Provide study literature and lessons for MOS tests

1. Some of the reasons for developing this study are shown here. By doing this exercise together it was felt th..t it would prevent each school from systems engineering all the subjects areas. Many schools of course had already done extensive systems engineering work on many of the subject areas in designing the NCOES resident courses, however many tasks involved in this study involved the 10 and 20 skill levels.

2. One of the big reasons for the study was to make it easier for a soldier to study for his MOS test. Currently, for example, the infantry soldier has to study 50 or so field manuals and other references. This study is intended to reduce these. The initial plan was to have 3 manuals to include a fundamentals manual, a career management field or branch manual, and an MOS specific manual. However, we may end up with more than three. Nevertheless in any event, the number of study references will be greatly reduced.

3. The major product of the study will be audio-visual lessons produced by each combat arms school and provided to units throughout the Army. Performance oriented lessons will be available at battalion level.

4. Also planned is the production of diagnostic tests from the tasks identified. These tests will be available to the unit commander. As new men arrive they will take these tests to determine their status of training. The man can then be designated to take certain audio-visual lessons in areas needed.

5. Some tasks are not adaptable to the audio-visual methods. Many of these will be supervisor's tasks. How-to-train publications and lessons will be developed for these areas.

6. Finally, when these critical tasks identified are incorporated into the MOS tests, the training publications and audio-visual lessons developed will provide the study references.

Problem Areas in Eight Combat MOS Study. This slide shows some of the problem areas experienced so far in the project with soft skill tasks.

SLIDE 6

SIGNIFICANT PROBLEMS IN SYSTEMS ENGINEERING SOFT SKILL TASKS

Determining proper level of specificity for task statements
Determining difference in standards and supporting SKAS
    between leaders and their subordinates
Providing for cross-training requirements
Stating preventive tasks eg "avoid improper use of drugs"
    in positive terms
Determining a measurable job standard for soft skill tasks

Writing the task statements at the proper level is a continuing problem area. With soft skill tasks, my experience indicates that it is very important to break down the tasks to specific low level requirements. It is only then that a measurable job standard can be derived. For example, Prepare a Unit CBR Plan, is too broad a task to develop a meaningful standard. Even the subtasks of Prepare a Chemical Defense Plan or Prepare a Biological Defense Plan are too broad. Perhaps a subtask or task like Select Personnel for the Monitoring Team is more correct as the level of specificity. The standards may differ for the same task between the doer and the supervisor. This has presented some problems. The standards for the supervisor would include different considerations for example, who, what, when, how, and why. In many cases additional skills, knowledges, and attitudes may also be required for supervisory tasks. Another problem area is cross-training. It is easy to say that we want everyone to read a map, use a compass, operate a radio or service a vehicle. But is this a cross-training requirement or does he actually do it in his duty position? For the purpose of the eight combat MOS study we checked the matrix for tasks performed only by the incumbent in the duty position. The unit commander is responsible for cross-training and

he can use the task inventory and determine his cross-training requirements. How do you state as tasks, "don't steal, don't gamble, don't use drugs, don't go AWOL or don't fight with your buddies"? Also, how do you write a job standard for negative tasks such as these? My answer is: don't try, they shouldn't be tasks to start with. They are attitudes or knowledges supporting the tasks Preserve your Character or Preserve your Ability to Perform your Job. I'm sure all of us are concerned with the last item in this list. How do you derive a job standard for a soft skill task? It is not easy, but it can be done and of course it must be done if we are going to provide the proper amount of training.

SLIDE 7

DERIVING JOB STANDARDS FOR SOFT SKILL TASKS

Define the desired product resulting from task performance
Analyze consequences that might result from improper performance
  or failure to perform the task
Break down broad soft skill task statements into subtasks that
  can be measured in specific terms
Derive check lists for supervisory tasks performed by leaders
Describe limits of acceptability in terms of speed, quantity and
  quality of product/work

Deriving Job Standards for Soft Skill Tasks. This slide shows the procedure employed by the Infantry School in deriving job standards for soft skill tasks in the Eight Combat MOS Study. Many soft skill tasks result in a product. In such cases, parameters should be defined. In other cases, analyze what would happen if the task was not performed at all, or what the consequences would be if an inexperienced or unskilled job incumbent performed it. How would the unskilled incumbent go astray? How would it affect the unit's mission? Having made this analysis then the standard can consist of those things he must do to avoid the consequences of poor performance. The further you breakdown soft skill tasks the easier it is to derive the standard. For supervisory tasks or unit tasks, a series of detailed check lists like the check lists for a unit ATT can be the standard. As with hard skill tasks, limits can often be described in terms of speed, quantity or quality.

Summary. I hope I have in this short period given you an idea of how we are systems engineering soft skills in the Eight Combat MOS Study. I feel it is an exciting study and it will have a tremendous affect on all training conducted in units.

THE "IDEALS" SYSTEM APPROACH

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TV RECORDING OF DR. NADLER'S PRESENTATION IS

AVAILABLE UPON REQUEST FROM CONARC TRAINING

AIDS AGENCY, FORT EUSTIS, VIRGINIA 23604.

(A 60 minute blank video cassette tape must
 be provided)

WORKING GROUP DISCUSSIONS
SUMMARY

The organization of conferees into small working groups and the scheduling of presentors to appear in each group for questioning and discussion stimulated extensive interaction among participants. The nature of the discussions indicated that conferees were experienced and knowledgeable in the area of systems engineering and eager to exchange ideas on problems associated with systems engineering of soft-skill courses. The discussions also revealed that schools with courses containing considerable amounts of soft-skill content had much greater difficulty applying CON Reg 350-100-1 than schools with courses containing considerable amounts of hard-skill content.

Initially, conferees were inclined to employ a hard skill - soft skill dichotomy of tasks as a referent for discussions. However, it became apparent early in the discussions that a distinction was unrealistic. Not only was a working definition of soft skills virtually impossible to develop but the terms <u>hard skill</u> and <u>soft skill,</u> as defined in CON Reg 350-100-1, did not represent mutually exclusive categories of course relevant tasks. Furthermore, it became apparent that such a categorization of tasks is not essential to the systems engineering process and, in some instances, may even generate misunderstandings. As a result, <u>a majority of the groups concluded that no distinction should be made between hard skills and soft skills and recommended that the term "soft skills" be eliminated from systems engineering terminology.</u>

During the discussion on task classification it was proposed in several groups that tasks are of such nature that they can be distributed along a continuum with specific, easily described tasks on one end and general, difficult-to-describe tasks on the other. In discussing this concept, conferees addressed the question -- is CON Reg 350-100-1 suitable for all tasks on the continuum? Some conferees were adamant in the opinion that the regulation is appropriate and adequate for all tasks, while others were equally adamant that the regulation is not suitable for the general tasks. A considerable number appeared to hold opinions ranging between the two extremes, believing the regulation could apply reasonably well to most tasks and functions if flexibility were permitted in the degree of specificity required for objectives and other systems engineering products in the general task areas.

In other group discussions a variation of the task continuum concept was proposed. In this concept, specific tasks were characterized as being composed primarily of specific information and psychomotor skills, while general tasks were considered to consist of process with an undergirding of specific knowledge and mental skills. In this regard it was noted that decision making is a process, but in order to make a sound decision an individual must possess the fundamental facts relevant to the decision. It was also noted that the mental skills of discrimination and reasoning are a part of the decision making process. One group stressed the importance of process in general tasks by concluding that in systems engineering general tasks we most definitely need to be more concerned with "how a decision is made" and "why it is made" than with the content or the nature of the decision itself.

Reacting to the various approaches to systems engineering of soft skills which had been presented to them, conferees expressed concern about the presence of multiple action elements in sample objectives and the absence of identifiable standards in several of the approaches. The Behavioral Model approach presented by Dr. Whitmore was considered to be viable, and the feature of analyzing some performances from a task standpoint and others from the standpoint of process was well received. Goal Analysis presented by Dr. Mager and the IDEALS systems approach presented by Dr. Nadler were considered relevant and promising, but in need of further definition and explication before they could be applied to the specific training situations of CONARC schools. The philosophical approach which gave consideration to cybernetic principles and recognized process as an important element in course structure was very provocative. Many conferees were intrigued by this approach and by its possible use in such functional and general task areas as supervision, leadership and counseling. Consequently, a majority of the groups recommended that CON Reg 350-100-1 be revised to include a cybernetic or comparable approach for placing proper emphasis upon the process aspects of content in CONARC courses. In connection with this revision, conferees expressed a desire for an annex containing examples of systems engineering products in the general task areas. These examples would include tasks, objectives, conditions, and standards as well as evaluative instruments and techniques.

While developing primary recommendations in accordance with the purpose of the discussions, working groups developed some subsidiary findings and recommendations as well. Some of these are listed below.

1. Schools should insure that group interaction and group process are not lost as a result of the emphasis placed on individual job skills and individualized instruction.

2. Schools having common systems engineering problems should use a commonality approach to resolve these problems (e. g. Eight Combat Arms MOS Study).

3. CONARC should establish a course development workshop that will provide training assistance and experience in systems engineering the broad, conceptual, general tasks.

4. Schools need a regulation that is general enough in nature to meet the needs of all schools for mission guidance, yet not unduly restrictive or limiting to any school in determining how it can best achieve its purpose.

5. Schools desiring an exception to a systems engineering requirement should submit a request documenting the desired change(s), the rationale for the desired change(s), and the procedures that will be followed. Prior to approval/disapproval CONARC should review the request for possible research projects, need for expert assistance and commonality of problems among schools.

6. Systems engineering should not be considered mandatory for all schools and courses.

7. CONARC should provide assistance with regard to guidance and resources for both internal and field validation of instructional technology (systems engineering).

APPENDIX A

RATINGS OF 35 COMMON OFFICER JOB FUNCTIONS ON THREE "HARD-SOFT" SKILL DIMENSIONS

LIST OF JOB FUNCTIONS:

	Importance	Degree of Interaction With A Machine	Degree of Specificity of Behaviors to be Performed	Typical Kind of On-The-Job Situation
1. Formulates and evaluates hypotheses regarding probable enemy actions.	Great	Never	General	Emergent
2. Evaluates the capability and limitations of his unit to perform its primary assigned mission (combat or non-combat).	Great	Little	General	Medial*
3. Interprets and uses a military map.	High	Little	V Spec	Established
4. Formulates and evaluates alternative tactical or operational plans.	Great	Never	General	Emergent
5. Briefs subordinates/visitors/seniors on action to be taken or on status of unit.	Great	Little	Moderate*	Medial*
6. Debriefs subordinates after action has been taken.	High	Never	General	Medial*
7. Identifies operational problems or deficiencies.	Great	Little	General	Emergent
8. Develops training programs to correct operational problems or deficiencies.	Great	Little	General	Emergent
9. Identifies information and resources required to carry out training pro- grams.	High	Little	Moderate	Medial*
10. Inspects and determines worth, quality, or state of a mission operation, installation unit, or item.	Great	Little	General	Medial
11. Evaluates subordinates' job performance and career potential.	Great	Never	General	Emergent*
12. Provides guidance and establishes performance standards for subordinates.	Great	Never	General	Emergent
13. Conducts performance and career counseling of subordinates.	Great	Never	General	Emergent
14. Conducts personal counseling of subordinates.	High	Never	V Gen	Emergent
15. Establishes job roles and selects personnel for tasks.	Great	Little	General	Medial
16. Develops immediate subordinates into a cooperative and productive team.	Great	Never	V Gen	Emergent
17. Establishes management practices which develop all subordinate personnel into a cooperative and productive unit.	Great	Never	General	Emergent*
18. Assigns responsibility and delegates authority to lowest practical level.	Great	Never	General	Emergent*
19. Handles complaints and resolves conflict between argumentative (perhaps angry or hostile) subordinates.	High	Never	V Gen	V Emer

* = bimodal or flat distribution.

TABLE 1

RATINGS OF 35 COMMON OFFICER JOB FUNCTIONS
ON THREE "HARD-SOFT" SKILL DIMENSIONS

	IMPORTANCE	DEGREE OF INTERACTION WITH A MACHINE	DEGREE OF SPECIFICITY OF BEHAVIORS TO BE PERFORMED	TYPICAL KIND OF ON-THE-JOB SITUATION
20. Motivates subordinates and maintains self-discipline through use of positive and negative incentives.	Great	Never	General	Emergent
21. Develops capacity of subordinate leaders to assume increased responsibility and initiative without close supervision.	Great	Never	General	Emergent
22. Changes subordinates' counter-productive attitudes toward more positive ones (e.g., increases positive attitudes toward safety, reduces prejudices).	High	Never	V Gen	V Emer
23. Determines and evaluates his subordinates' morale.	High	Never	V Gen	Emergent
24. Determines and maintains trust and "open" (two-way) communications.	Great	Never	V Gen	V Emer
25. Sets rules and standards for subordinates' behavior.	Great	Never	Moderate*	Medial
26. Defines and communicates goals and objectives for subordinates and establishes priorities.	Great	Never	General	Emergent
27. Allocates resources to achieve objectives and goals.	Great	Little	General	Medial
28. Facilitates innovation in the existing organization or system.	High	Little	V Gen	V Emer
29. Determines the adequacy of new procedures, concepts, or equipment at each stage during development (e.g., CDC type job).	High	Moderate	General	Emergent
30. Instructs subordinates face-to-face (e.g., how to read a map).	High	Moderate*	Moderate*	Established
31. Teaches an introductory course or general subject (e.g., combined arms concepts in the C-22 course).	Moderate	Little	Specific	Established
32. Solves problems where the correct answer is not known (e.g., R & D type job or a problem in leadership).	Great	Little	V Gen	V Emer
33. Makes tactical and administrative decisions based on current information.	Great	Little	General	Emergent
34. Directs and controls employment of a unit in a training or combat situation.	Great	Little	Moderate*	Emergent
35. Administers military justice to maintain discipline.	High	Never	Specific	Medial*

* = bimodal or flat distribution

TABLE 1 (CON'T.)

ADEQUACY OF DOCUMENT DESCRIPTIONS
AND EASE OF SPECIFICATION
FOR 35 COMMON OFFICER JOB FUNCTIONS

LIST OF JOB FUNCTIONS:

	IMPORTANCE	DOCUMENT DESCRIPTION			SPECIFICATION OF JOB REQUIREMENTS
		BEHAVIORS TO BE PERFORMED	CONDITIONS OF PERFORMANCE	STANDARDS OF PERFORMANCE	
1. Formulates and evaluates hypotheses regarding probable enemy actions.	Moderate	Moderate	Moderate	Inadequate	Difficult
2. Evaluates the capability and limitations of his unit to perform its primary assigned mission (combat or non-combat).	Great	Moderate	Inadequate	Moderate*	Difficult
3. Interprets and uses a military map.	High	V Adeq	V Adeq	Adequate	V Easy
4. Formulates and evaluates alternative tactical or operational plans.	Great	Moderate*	Moderate	Inadequate	Difficult
5. Breifs subordinates/visitors/seniors on action to be taken or on status of unit.	Great	Moderate	Moderate*	Moderate*	Easy
6. Debriefs subordinates after action has been taken.	High	Moderate	Moderate*	Moderate	Moderate
7. Identifies operational problems or deficiencies.	Great	Inadequate*	Inadequate	Inadequate	Difficult
8. Develops training programs to correct operational problems or deficiencies.	Great	Inadequate	Inadequate	Inadequate	Moderate
9. Identifies information and resources required to carry out training programs.	High	Adequate	Adequate	Inadequate*	Moderate
10. Inspects and determines worth, quality, or state of a mission operation, installation unit, or item.	Great*	Moderate*	Moderate	Moderate	Difficult
11. Evaluates subordinates' job performance and career potential.	Great	Inadequate	Inadequate	Inadequate	Difficult
12. Provides guidance and establishes performance standards for subordinates.	Great	Inadequate	Inadequate	Inadequate	Difficult
13. Conducts performance and career counseling of subordinates.	Great	Inadequate*	Inadequate	Inadequate	Difficult
14. Conducts personal counseling of subordinates.	High	Inadequate	Inadequate	V Inad	Difficult
15. Establishes job roles and selects personnel for tasks.	Great	Inadequate*	Inadequate	Inadequate	Moderate
16. Develops immediate subordinates into a cooperative and productive team.	Great	Inadequate	Inadequate	Inadequate*	Difficult
17. Establishes management practices which develop all subordinate personnel into a coop. ... ive and productive unit.	Great	Inadequate	Inadequate	Inadequate	Difficult
18. Assigns responsibility and delegates authority to lowest practical level.	Great	Inadequate	Inadequate	Inadequate	Difficult
19. Handles complaints and resolves conflict between argumentative (perhaps angry or hostile) subordinates.	High	V Inad	V Inad	V Inad	Difficult

* = bi-codal or flat distribution.

TABLE 2

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ADEQUACY OF DOCUMENT DESCRIPTIONS AND EASE OF SPECIFICATION FOR 35 COMMON OFFICER JOB FUNCTIONS

		DOCUMENT DESCRIPTION			
	IMPORTANCE	BEHAVIORS TO BE PERFORMED	CONDITIONS OF PERFORMANCE	STANDARDS OF PERFORMANCE	SPECIFICATIONS OF JOB REQUIREMENTS
20. Motivates subordinates and maintains self-discipline through use of positive and negative incentives.	Great	Inadequate	Inadequate	Inadequate	Difficult
21. Develops capacity of subordinate leaders to assume increased responsibility and initiative without close supervision.	Great	Inadequate	Inadequate	Inadequate	Difficult
22. Changes subordinates' counter-productive attitudes toward more positive ones (e.g., increases positive attitudes toward safety, reduces prejudices).	High	V Inad	V Inad	V Inad	Difficult*
23. Determines and evaluates his subordinates' morale.	Great	Inadequate	Inadequate	Inadequate	Difficult
24. Determines and maintains trust and "open" (two-way) communications.	Great	Moderate	Moderate	Moderate	Moderate
25. Sets rules and standards for subordinates' behavior.	Great	Moderate	Moderate	Moderate	Moderate
26. Defines and communicates goals and objectives for subordinates and establishes priorities.	Great	Inadequate	Moderate*	Inadequate	Moderate
27. Allocates resources to achieve objectives and goals.	Great	Moderate	Moderate*	Moderate*	Moderate
28. Facilitates innovation in the existing organization or system.	High	V Inad	V Inad	V Inad	V Diff
29. Determines the adequacy of new procedures, concepts, or equipment at each stage during development (e.g., CDC type job).	High	Moderate*	Moderate*	Inadequate	Difficult
30. Instructs subordinates face-to-face (e.g., how to read a map).	High	Adequate	Adequate	Adequate	Easy
31. Teaches an introductory course or general subject (e.g., combined arms concepts in the C-22 course).	Moderate	Adequate	Adequate	Adequate	Easy
32. Solves problems where the correct answer is not known (e.g., R & D type job or a problem in leadership).	Great	Inadequate	Inadequate	V Inad	V Diff
33. Makes tactical and administrative decisions based on current information.	Great	Moderate	Moderate*	Inadequate	Difficult*
34. Directs and controls employment of a unit in a training or combat situation.	Great	Moderate	Moderate	Moderate*	Difficult
35. Administers military justice to maintain discipline.	High	Adequate	Adequate	Adequate*	Moderate*

* = bimodal or flat distribution

TABLE 2 (CON'T.)

APPENDIX C

A BEHAVIORAL MODEL (PURPOSE ANALYSIS) OF A LEADERSHIP FUNCTION
BASED ON PRINCIPLES OF BEHAVIOR MODIFICATION

01 Designs and implements management practices which strengthen productive behaviors and weaken counter-productive behaviors emitted by his people.

01 01 Designs and implements practices for reinforcing productive behavior.

01 01 01 Identifies and defines productive behaviors.

01 01 02 Specifies and implements techniques for monitoring the occurrence of productive behaviors.

01 01 03 Identifies potentially effective and feasible positive reinforcers.

01 01 04 Designs and implements techniques for the contingent administration of positive reinforcers on an appropriate schedule.

01 01 05 Modifies reinforcement program if desired changes fail to occur.

01 02 Designs and implements practices for minimizing the inadvertant reinforcement of counter-productive or disruptive behavior.

01 02 01 Identifies and defines counter-productive or disruptive behaviors.

01 02 02 Specifies and implements techniques for monitoring the occurrence of counter-productive or disruptive behaviors.

01 02 03 Designs and implements techniques for eliminating the inadvertant reinforcers.

01 02 04 Modifies reinforcement elimination program if desired changes fail to occur.

01 03 Designs and implements practices for minimizing the occurrence of aversive stimuli in the environment.

01 03 01 Identifies aversive stimuli in the environment.

01 03 02 Designs and implements techniques for eliminating or reducing aversive stimuli in the environment.

GENERAL OPERATIONAL CHARACTERISTICS
OF A "MOTIVATED WORKER"

01 Performs an adequate amount of work that leads to the attainment of organizational goals.

02 Exhibits a low frequency of interference with the work of others.

03 Coordinates his work activities with the work activities of others in keeping with organizational goals.

04 Helps others to perform their work, if necessary to meet organizational goals and if he is able to do so.

05 Minimizes the effects of outside disruptions on his own work and that of others.

06 Chooses to remain in the organization for the remainder of his work career.

SUGGESTED READINGS

Goal Analysis by Robert F. Mager, Fearon Publishers/Lear Siegler, Inc., 1972.

Behavioral Technology: Motivation and Contingency Management (Volumes I and II, and a student manual) by Lloyd Homme and Donald Toste, Individual Learning Systems, P.O.Box 3388, San Rafael, California 94902.

Teaching: A Course in Applied Psychology, by Wesley C. Becker, Siegfried Engleman, and Don R. Thomas, Science Research Associates, Inc., Palo Alto, California, 1971.

Managing Behavior: Parts I, II, and III by Vance R. Hall, H & H Engerprises, Inc., Merriam, Kansas, 1970.

APPENDIX D

TASK VALIDATION SURVEY

Code	Function/Task Statement	Do you do This Task?			Importance of Task			How This Task Was Learned					How Should Task be Learned?				
		Do Not Do	Do	Super- vise	1	2	3	1	2	3	4	5	1	2	3	4	5
A101	CONDUCT RELIGIOUS SERVICES																
A101.A	Provide an order for worship																
A101.B	Provide music for worship																
A101.C	Supervise choir/choral groups																
A101.D	Provide a sermon, homily, or mediation																
A101.E	Provide tape recorded worship aids																

APPENDIX E

CYBERNETIC SYSTEM MODEL
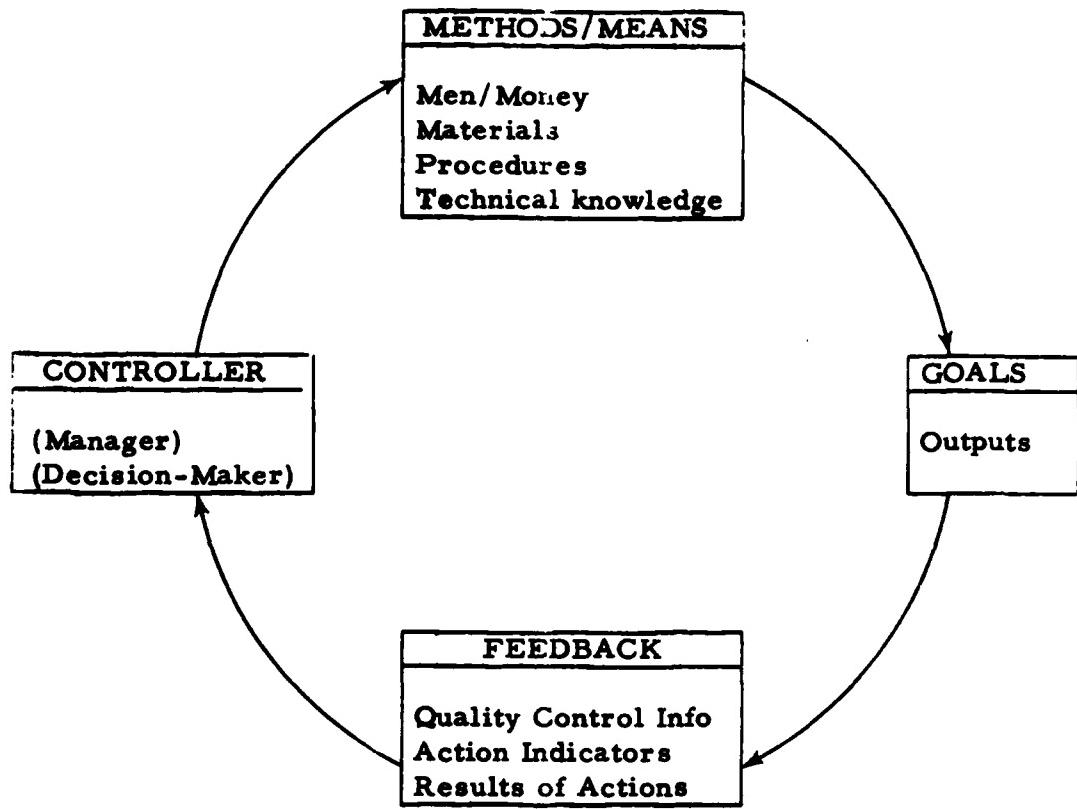
APPENDIX F

EIGHT COMBAT MOS STUDY

CONCEPT

11B	11C	11D	11E	13B	13E	16P	16R

IN	AR	FA	AD

COMMON SUBJECTS
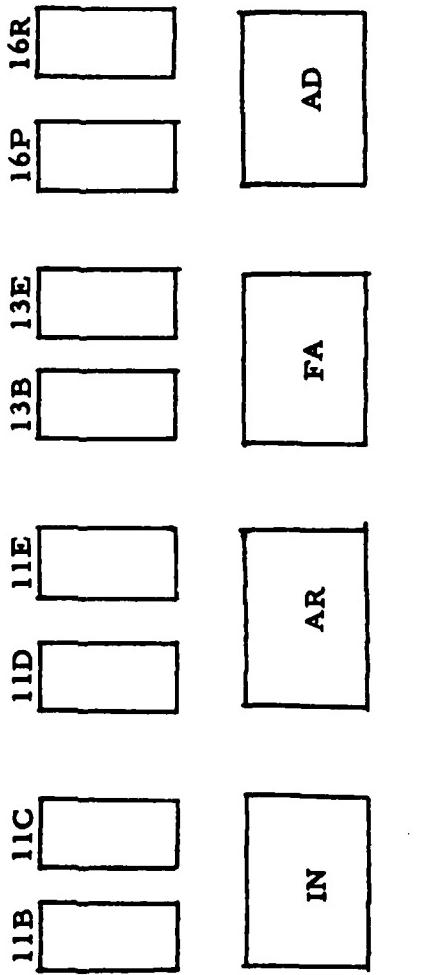
APPENDIX G

CATEGORIES COMMON TO EIGHT MOS

FIRST AID

PERSONAL HYGIENE

LAND NAVIGATION

CBR

PHYSICAL CONDITIONING

MILITARY INSTRUCTION AND TRAINING

DISMOUNTED DRILL AND INSPECTION

CODE OF CONDUCT, SURVIVAL, ESCAPE AND EVASION

INTELLIGENCE COUNTERINTELLIGENCE

PERSONAL AFFAIRS AND MOTIVATION

COMMUNICATIONS

COVER CONCEALMENT AND CAMOUFLAGE

GENERAL MAINTENANCE

GRENADE LAUNCHERS

RIFLES

MACHINE GUNS

LEADERSHIP

WHEELED VEHICLES

TRACKED VEHICLES

OBSTACLES, BOOBYTRAPS, MINE WARFARE

RECON AND SECURITY PATROLS

ANTITANK WEAPONS

FIRE REQUESTS AND ADJUSTMENT

TACTICS

ADMINISTRATION, SUPPLY, MESS

HAND GRENADES

CIVIL DISTURBANCE

AMMUNITION HANDLING

FUNDAMENTAL X

BRANCH ____

MOS ____

CATEGORY: CBR

	11B DUTY POSITIONS								
	10			20			40		
	RIFLEMAN	LT VEH DRIVER	(ETC)	AUTO RIFLEMAN	MACHINEGUNNER	(ETC)	TEAM LEADER	SQUAD LEADER	PLATON LEADER
1. PREPARE UNIT CBR PLAN									X
2. RECOGNIZE CBR HAZARDS	X	X	X	X	X	X	X	X	X
3. GIVE CBR ALARM	X	X	X	X	X	X	X	X	X
4. INTERPRET CBR ALARMS AND SIGNS	X	X	X	X	X	X	X	X	X
5. M'RK AREAS CONTAMINATED BY CBR AGENTS	X	X		X			X	X	
6. (CONT)									

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CONARC SOFT SKILL TRAINING CONFERENCE

FORT BLISS, TEXAS

12-13 DECEMBER 1972

Sponsored by

US Continental Army Command

Hosted by

US Army Air Defense School

Final Report - In Five Volumes

VOLUME III

Methods and Media Specialty Workshop

GENERAL RALPH E. HAINES, JR.

Commander

US Continental Army Command

MAJOR GENERAL IRA A. HUNT, JR.

Deputy Chief of Staff for Individual Training

US Continental Army Command

CONARC SOFT SKILL TRAINING CONFERENCE

METHODS AND MEDIA

III

CONARC SOFT SKILL TRAINING CONFERENCE
Fort Bliss, Texas
12-13 December 1972

Volume III - Methods and Media Specialty Workshop

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SPECIALTY WORKSHOP SCHEDULE

for

METHODS AND MEDIA

Chairman: Mr. Thomas E. Chandler
           Educ Adv, USACMLCS
----

13 October

AM	PM		
0800-0810	1300-1310	Introduction	Mr. Thomas E. Chandler USACMLCS
0810-0845	1310-1345	Methods and Media Used in the Redesigned COAC	LTC James H. Sewell USACMLCS
0845-0920	1345-1420	In-Basket Test	Dr. Charles W. Kroen, Jr. USASCS
0920-0955	1420-1455	Learning Centers	Mr. Clarence C. Newsom USAAVNS
0955-1015	1455-1515	Break	
1015-1050	1515-1550	Computer Simulations	Major Bernard Meacham USAQMS
1050-1125	1550-1625	Results of the SMMART Army Training Survey	Mr. Harold L. Moon HumRRO
1125-1130	1625-1630	Discussion and Summary	Mr. Thomas E. Chandler USACMLCS

WELCOME TO THE METHODS AND MEDIA WORKSHOP

Welcome to the Methods and Media Workshop of the Soft Skill Training
Conference. This session will consist of five presentations. Four
of the presentations will be made by representatives of four of the
service schools. They will discuss their experience in the selec-
tion and application of various methods and media to some of their
training problems. Then Mr. Moon from the HumRRO Unit at Fort Knox
will give us a brief report on Work Unit SMMART.

I will serve as Chairman and Introducer of the speakers. Each
speaker will have approximately 35 minutes for his presentation and
discussion. We want active participation by the conferees during
the discussion periods. Your contributions are needed so that we
can give adequate consideration to the many possibilities of Methods
and Media. Any questions not adequately answered during the speakers'
allotted 30 minutes can be considered during the final discussion and
summary period.

I will now introduce our six speakers in the order of their appear-
ance on the program:

LTC James H. Sewell, Career Course Manager at the US Army Chemical
Center and School

Dr. Charles W. Kroen, Research Psychologist at the US Army Signal
Center and School

Mr. Clarence C. Newsom, Educational Advisor at the US Army Aviation
School

Major Bernard Meacham, Chief, Automation Branch, Supply Career
Department, US Army Quartermaster School

Mr. Harold L. Moon, Research Psychologist with the HumRRO Unit at
Fort Knox

Since we do have a full program we will move right on to our first
presentation, Methods and Media Used in the Redesigned Chemical
Officer Advanced Course, by LTC Sewell!

CONARC SOFT SKILL TRAINING CONFERENCE
Methods and Media Used in the
Redesigned Chemical Officer
Advanced Course

LTC James H. Sewell
USA Chemical Center and School
Ft McClellan, AL

The title of this presentation is centered around Methods and Media.
I am not quite sure that I know what is meant or understood by these
two terms. The Oxford Dictionary tells me that media are vehicles
of perception and that a method is a special form or procedure used
in any mental activity. But dictionaries are historical documents
more than they are current authorities. They can tell me only what
usage was made of terms by past writers, not what my present meaning
is or, more importantly, what meaning will be given the terms by my
present listeners. We are all engaged in a process of approximation.
I will say things that approximate what is in my mind. The thoughts
that occur in your minds will approximate what I tried to say. I
ask of you only that you do not attach undue demands on the words I
use, for they are our tools of approximation. What is in my mind
at this moment is different from that when I was putting together
these notes...yet I am reasonably satisfied that the words express
some of my present feelings.

I am uncomfortable right now. I have been uncomfortable for a long
time. Certainly, this is a group of prestige and influence enough
to make me humble. But that is not all of it. We are all person-
ally involved with the evolution...or revolution...that is taking
place in the Army School System. And that does generate genuine
distress and anxiety in me, for there is no more crucial institution
in the Army than its school system. At one time or another, every
soldier...man or woman...will be influenced by an Army school. I
cannot think of another Army institution that can make that claim.
We alone will see them all. And we can be certain of it. What will
we do with this opportunity?

There was a story told of a self-help advisor working in a depressed
rural community. He asked a woodcutter how much wood he was able to
cut in a week with his single-bitted axe. The woodcutter answered
that he usually got about three cords. The advisor then gave him
a new McCulloch chain saw and told him he would check back in a few
weeks to see what improvement the saw would make. Upon questioning
the woodcutter several weeks later, he was told that only one cord
per week had been cut. The advisor felt that there might be some-
thing wrong with the saw. He primed it, gave the cord a pull, and
was rewarded with a full-throated roar as the engine caught. The
woodcutter cried, "What's that noise!"

I wonder, now, if we are not much like the woodcutter: swinging our new tools like an axe. We have a tool of vast potential in the concept of System Engineering...and we use it to produce the same type of ineffective curricula that we used to get on intuition alone. We have a new type of soldier, and we appeal to him or her with the myths of two generations ago. I recently observed a class in which the motivational quote used was 17 years old! We have educational aids such as ETV, computer assisted instruction, and sophisticated audio-visual techniques which we use to give answers to questions that will never be asked! One of our faculty came up with this limmerick:

> An Advanced Course student with tact
> Absorbed many answers he lacked
>> But out on the job
>> He decried with a sob
> How does one fit answer to fact?

And yet one must notice that the Army continues to produce highly competent people from its school system. Is it perhaps that we produce talented and capable people despite our system? And has it occurred to you that our Chief of Staff twenty years from now has already finished his Advanced Course? Of course, he still will have a chance to be rounded out by Command and General Staff School and the War College; but must we rely overmuch on these? For the great number of officers who will attend neither of these senior schools, the Advanced Course is the last they may see of Army schools. It would appear that the Advanced Course should be sufficient preparation for the general staff officer.

But what of methods and media? Consider for a moment the store of knowledge, skills, attitudes, behavior, or "know how" that you have accrued since you have been associated with the Army. Although certainly not complete (for I know of no manager who is absolutely satisfied with his performance on all tasks), you do owe whatever effectiveness you have to these abilities. How much...what proportion...of your present store of knowledge was obtained as a student in a classroom? Would anyone guess more than 10%? How about 5%? No takers? For myself, I must say that something less than 1% of my ability was acquired in a classroom as a student. But we do learn, do we not? Have you not learned quite a bit, some of it being of real value? How did you learn it?

In real life, we learn things by facing a task or being involved in a situation, and striving to "solve" the problem. We do this by talking and interacting with people or by independent study. We are motivated by our perception of people whom we admire. We try to emulate them, to perform our jobs in a creditable fashion. Most work groups of people who really contribute to one another are relatively small: 4 or 5 people. If the group becomes much larger,

then too much effort will be spent in posturing before the group.
It's hard to fake it with a small group for very long.

There can be no discussion of the media used at the Chemical School
without a discussion of the method. In a real sense, the medium is
the method. Let me describe how our course came about and what it
is based on. In this way, we will see the effect of a new concept
of what a student is on the design of a career course and on the
educational institution itself.

In the Spring of 1971, a design group was given the broad charter
of "taking a look at the Advanced Course." We began with the normal
system engineering step of defining the tasks a graduate would be
expected to be able to accomplish. When you consider that the gradu-
ate we were talking about was an Advanced Course Officer...a captain
with 3-5 years service...the list was very imposing. In fact, the
partial list of tasks covered the walls and ceiling of the room and
was far from complete. It was not just that there were so many tasks
that could conceivably fall to this type of officer, but it was
apparent that no human alive could master all of them. Were we to
pretend that we would attempt to produce a graduate having skills
never before mastered? Or would we take a more realistic view and
attempt to define a more meaningful set of goals?

The decision was made to completely ignore all existing goals and
constraints in the design of the new course. We would begin with
the bare minimum of assumptions and seriously question any of these
that began to take on any amount of importance. In a sense, we
"buried the sacred cow...alive." We assumed that the course would
last 36 weeks. Certainly this was a safe assumption. Beyond that
we assumed only that the student we would have would be a captain or
senior lieutenant with 3 to 5 years of service. This assumption
proved to be safe and did not constrain us later. As you can see,
our solution grid was very wide.

Rather than asking what tasks a graduate must perform, we asked
what kind of a person could respond to the demands exemplified by
the tasks. Rather than performance objectives in terms of tasks we
arrived at a profile of the graduate in terms of his human qualities.
The profile looked like this:

   @ To be technically proficient

   @ To be able to identify and analyze complex problems

   @ To think imaginatively and in broad range

   @ To be skilled in interpersonal relations

@ To be able to communicate complex issues clearly in speech and writing

@ To be persuasive

@ To be aware of the major issues and problems of the Army and Society

@ To be relaxed in the presence of high ranking officers and officials

@ To be familiar with problems and procedures at various levels of command

We felt that this profile defined the main dimensions of an effective officer. These are the skills that get jobs done. We tried the profile out on everyone we could corner. The responses fell into two groups. First, people said they were "motherhood" items... intrinsically good. We disagreed with this observation on two grounds: that the items were essential for effectiveness and that they could be influenced during the Advanced Course. The second set of responses indicated that we were "right on." Curiously, general officers fell into this latter group. They said we were describing precisely the things that made them as effective as they were.

It is important to note that this profile described the whole man and not just his working dimensions. Unfortunately, in the eyes of some, we must contend with the whole man on a job. We cannot have only his job functions without also getting his personality, his personal problems, hang-ups, and all his human attributes.

Having accepted this profile as our goal, we decided that student-centered learning was the only method that would address the whole man. If we were to influence the complexity of each student, we must involve his total being in the learning process. We had then, and have now, an unfailing respect for the ability and responsibility that resides in the student. All learning must be done by the student and he is the only one who can motivate himself. We, as faculty, can only do what we can to make it happen.

Given that the student would provide the horsepower to learn, we elected to set the stage by way of real-life situations that the student could easily imagine himself in. We gleaned the inboxes of units everywhere for the types of problems that typify daily work. For the most part, dates and names were blocked out of on-going actions and the problems were fed to the student. This is the way we are tasked in real-life, and it worked for our students.

It has been said that experience is the best teacher, but that the
tuition fees are high. We worked to lower the cost to the student.
Examinations were eliminated. Class rankings were eliminated. The
atmosphere was made as threat-free as we could make it. Since many
of the problems passed out were still being worked on in real life,
there was no need for school solutions. Indeed, without the
necessity to grade the student, we found no need for solutions other
than those arrived at by the students.

The effect of real learning is that the person changes because of
it. If a person learns from solving a problem or coping with a
situation, it is certain that he would work that problem differently
in the future. Mistakes would be avoided and successful methods
would be intensified. For this reason, it was essential that the
problem solving process be undertaken again and again. Our course
was therefore structured in an iterative fashion. We elected, quite
arbitrarily, to have six phases of about equal length in the nine-
month course. One phase, the Radiological Safety Phase, would be
treated traditionally because of its quantitative and technical
nature. The other phases were titled Company/Battalion, Brigade,
Division, CONUS Installation, and Logistics/Higher Headquarters.
The titles merely suggest the level of problems addressed. Any
other hierarchy that would maintain the repetitive and increasing
complexity of problems would suffice. The idea was to expose the
student to a problem-solving exercise again and again.

One further thing is pertinent regarding these problems. The prob-
lem itself was imbedded in a situation. It was up to the student
to identify that problem. He must find it, and formulate it for
himself, then must invent a range of solutions. The single greatest
cause of ineffective solutions in real life is that the wrong prob-
lem is addressed or that it is improperly formulated.

The normal mode for class work was the small group. Students were
grouped into 4-5-man groups, each group being assisted by a Faculty
Consultant. Let me point out that the Faculty Consultant was in no
way a subject-matter expert on the material addressed by the student.
His role was to encourage and stimulate the student in a direct,
personal way. His normal method was face-to-face confrontation and
penetrating questions. All Faculty Consultants are Field Grade
officers. In operational control of the phase is the Phase Leader,
also a Field Grade officer. He is responsible for planning the
phase, for designing the situations to be presented, and for meter-
ing the flow of situations to the student. He has full authority
to change the schedule, to speed it up or slow it down. In short,
he is the man on the ground with the detailed knowledge and he is in
full control.

There are no set class hours for the student. He is given the situation and the relevant suspense dates. It is his task to organize the work so that the suspense is met with an effective and practical solution. He may request assistance from the full faculty on any subject by going through his Consultant. Traditional platform instruction does occur, but the student has the option of rejecting it if he so desires. In other words, relevance to the student is the criterion, not that the faculty thinks it is "good for him." It is appropriate to mention that in handling three classes under this method, there has not been a single instance of the student taking advantage of the system for his own selfish needs. The student has always demonstrated more dedication and sense of responsibility than ever in my experience.

Students are evaluated continuously on an informal basis, and after the end of each phase in a formal fashion. At the close of the phase, the Faculty Consultants and Phase Leaders meet to discuss each individual student. The orientation is towards needs each student has and how they may be satisfied in future phases. The direction is towards changing the course to fit the student rather than a ranking of students. During the course each student is carefully evaluated by a minimum of 14 field grade officers.

Our experience so far has been that there is no difficulty in selecting the Distinguished Graduate. He stands head and shoulders above the class and is obvious to everybody. As for Honor Graduates, we have surveyed the classes themselves for those students who are judged to be the most likely to succeed. The students' judgments coincide perfectly with those of the faculty, so this is not as big a problem as one would imagine. After a long period of time in close, personal contact with each student, valid evaluations can be made.

So there you have our method. It is student-centered, situation stimulated, and iterative. The medium is a threat-free atmosphere dedicated to satisfying the needs of the students. Operational control is delegated to the Phase Leader on the spot rather than being dominated by a fixed schedule. Responsiveness to perceived needs of the students is essential. Maximum latitude is given the student in pursuing his goals. And the goals must be those of the student.

The results so far have been encouraging. The students indorse the course philosophy without qualification. Their motivation continues through the last day of the course. Reports from recent graduates state that they consider the preparation given them was relevant and sufficient.

There have been many problems. Foremost among them has been the agonies of our faculty in internalizing the philosophy. No longer

is an instructor, or a consultant, or a Director of Instruction an authority only because he controls the questions that may be asked to those he knows the answers to. The student's questions are generated by the student and are relevant to him. They are serious questions. They are good questions and they deserve being asked and answered. But it is not the job of the faculty to answer all questions. Question asking and answer finding go hand in hand. Both must be done by the student, and he is willing and able to do them.

At one time, a question that could not be answered by the subject expert was considered to be a "wise-guy" question...sharpshooting. Later we qualified this so that the instructor was permitted to say, "I don't know the answer, but I will find out for you." This has the nice effect of maintaining the student in a subservient role: and dependent on the faculty. Under our current method, we encourage the instructor to admit candidly that he doesn't know the answer to that question, but that perhaps it is a good question. Period. If the student persists with the question, we then come to a question which is appropriate in education, which is, "How do you think you could go about finding out the answer to that question?" It is not the consultant's role to be the fount of all knowledge. The student already knows that no one knows all the answers, so we should not worry too much about giving ourselves away. It does, however, put quite a strain on us.

Questions and Discussion following LTC Sewell's Presentation

Q. How do the students react to the faculty in this type learning situation?

A. Very favorably. The students and faculty are closely associated for a longer period of time than they were in the former course. The faculty member is accepted by the students as a resource from which they can receive guidance. The biggest problem the faculty has is in learning to say, "I don't know." Under the old concept the faculty would say in answer to a question, "I don't know, but I'll find out." Under the new concept the faculty is encouraged to say, "I don't know. How do you think we ought to go about finding the answer?"

Q. How can you justify a school system like that where all you are doing is putting a student in the same realistic type situation he would find on the job? Why not assign the student to a variety of real staff positions and let him learn on the job?

A. Except for one thing that would be fine. On a real staff you cannot put the man in a low threat environment. You cannot promise him that his boss won't chew him out. Also the rest of the staff is so busy they won't have time to interact with the man in a way that will be meaningful for learning through small group inter-action.

Q. How could someone sitting at CONARC justify a course like this? It seems that a course of this type could destroy the school system.

A. A person sitting at CONARC should be called on to justify only the goals of the course. The details of attaining these goals can-not be judged from a position remote from the student; that is, at a position higher than the School Commandant. It is true that the school system, as it now exists, will have to be changed, but that is obviously needed anyway.

Q. Doesn't it take several years to get the various levels of experience you need in the faculty to provide the understanding of the various situations you subject the student to?

A. Yes. The student is subjected to far more real situations at the various levels of command than any faculty member has experi-enced. It is usually about half way through the course that the faculty consultant will come to the phase leader and say, "Could you give us an advance sheet?" In effect they are saying that the student has passed the faculty in their ability to solve the prob-lems. They already have more experience than the faculty. The

faculty is no longer the expert and the students start demanding less and less of the faculty in the way of subject-matter answers. The role of the faculty shifts to that of encouraging and stimulating the students, and this requires much training.

Q. Would you say that generally what you have is a catalyst in terms of a problem?

A. Yes, but we don't tell the student what the problem is. He may have to find the problem or determine that there is no problem.

Q. Is your conventional media such as TV and training films used?

A. Yes, conventional instruction is used as needed. In any area where the student is weak and does not possess the background and knowledge to learn without additional help, he has the entire faculty as a resource. This may come in the form of lectures, TV, Training Films, or some other method or media. The students also present instruction to each other.

Q. Three quick questions:

   a. How many students are in your advanced class?

   b. How many classes do you have a year?

   c. How do you handle your electives?

A. We have 27 students in the present class. We had two classes last year and one this year. We have 20 or 30 electives. The electives term coincides with the terms at the local Jacksonville State University. The students can either take courses at the University or take in-house electives.

Q. Do you ever give the students current school problems to work on such as staff studies to solve current problems?

A. Yes. A few months ago they were given the problem to study the Fort McClellan Officers Open Mess. It was a well done study and it was given to the post commander.

Q. What size groups do the students work in?

A. Usually the groups are small. It depends on what they are doing. Usually they work in about a five-man group.

Q. How would you suggest that we handle about a thousand Advanced Course students at the Infantry School using this mode?

A. That's a good question. It has been our experience that it took about 7.3 manyears of field grade officers to put on one class. I don't feel that that is necessary. For the first time the faculty is not indispensable. If we mailed the situations to the students all we would lose would be the personal bounce against the faculty member. If the student were used to that type learning he could get by without a faculty consultant. If we had a super control mechanism we could get by without a phase leader, but he is our expansion joint that fixes everything to make the day run. During the next phase we are going to withdraw two of the faculty consultants. For his five groups the phase leader will have only three faculty consultants. The phase leader of the last phase said that he could get by with only one faculty consultant. By that time the students have learned how to learn on their own. Manpower consumption can be drastically reduced. If people are used to it and know how it works, a thousand students could be handled in however many groups you need. The faculty consultants are used only about two hours a day.

Q. Are there suspenses assigned to projects?

A. Yes. The phase leader assigns suspenses and he may adjust this to compensate for the student's progress.

Q. Is the evaluation based on the student's achievement of the requirement and meeting the suspense?

A. The evaluation is done subjectively by the phase leader and the faculty consultants. There are various evaluation points throughout the phase. It may be, "At this point the student will present a briefing or a staff paper. This is the point at which I would ask the phase leaders and faculty consultants to be there to observe the presentation."

Q. The Chaplains School is using groups of about 12 and you are using groups of 5. Why do you use the smaller group?

A. It is harder to hide in a five-man group. For the short time he stays in one phase he might be able to sandbag and stay out of the problem. Also in most staff sections in which the faculty has had experience, this experience shows that the most effective working group is about five. With five people every man is sucked in. He can't stay out. The group won't let him because if one man drops out that is a 20% increase in workload. A point of interest is that we have two allied officers in the class. One is Australian and handles the language well. The other is a Turkish officer who speaks the language well but feels that he has trouble writing. The small group environment is perfect for him because he is not

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the least bit reluctant to try his less than perfect English since, if the group does not understand him, they can ask over. He is working well in this type environment.

Q. Are the situations which you assign to the students given in writing or orally and in what form are they given?

A. They come in all sorts of forms such as a letter, DF, buck slip, or written note. To give you an example, last year during Phase V, the Installation Phase, which was getting near the end of the course, the class was given an assignment. It was a handwritten note saying, "I am considering ordering a study for an automated information system for this installation, Fort McClellan. Give me a briefing on 8 April at 1000 hours of about 30 minutes on what makes this installation tick--who does what to whom. Signed, Gen Enemark, DA, IG." Gen Enemark was scheduled to be here at that time. As it turned out he could not come so he sent the assistant IG, Gen Hamblin. For about two days the students struggled with questions like, "What does he want? What is he asking about? What kind of briefing does he want?" They finally decided what the problem was and then they went out to all the activities on post and found out how the post works. Incidentally, the cooperation of other people is essential for this type of learning.

CONARC SOFT SKILL TRAINING CONFERENCE
The In-Basket Test: Its Development
and Application to Military Training

Charles W. Kroen, Jr.
USA Signal Center and School
Ft Monmouth, NJ

The construction of performance examinations for officer courses presents a unique challenge to the test developer. He is faced with a qualitatively different problem from that which exists in developing examinations for enlisted personnel. Managerial and administrative skills are usually being taught rather than specific equipment related skills such as the troubleshooting and repair of electronic equipment. Assessing the attainment of training objectives in this context is not a clear cut matter. Both administrative skills and administrative knowledge have to be measured. The real test of the effectiveness of officer training is not merely knowledge of effective managerial practices and procedures but rather the ability to translate this knowledge into action. In other words, a situational test is needed to assess managerial and administrative ability. This test for maximum effectiveness should be a realistic simulation of the actual job situation that the student is being trained for. He must be exposed to the kinds of problems and required to make the kinds of decisions that he will have to make on the job. Only in this way can we obtain an accurate gauge of the effectiveness of officer training and feel certain that we are preparing the officer to face the kinds of challenges he will be exposed to in the field.

One of the most promising training evaluation instruments that can be used to assess officer training is the in-basket test which was originated by Dr. Norman Frederiksen and his colleagues at the Educational Testing Service.

The in-basket test obtains its name from the in-basket or tray usually situated on a manager's desk in which letters, reports, memos, and other papers are deposited for his attention and action. The contents of the tray serve as the problems for the in-basket test. The person reviews and takes action on these problems. Thus, the in-basket test is essentially a job performance test of managerial and administrative ability. It projects the person engaging in this exercise into a specific role which he is to perform for a given period of time. Usually, he is given background information for his role, in other words, who he is and how he got to be put into the given situation. Other background information such as an organization chart, job descriptions of subordinates, and important upcoming events are also provided in order to help the person gain a proper perspective. The important point in providing the person with background information is to make the situation appear as realistic as possible and to provide

him with the necessary information to deal effectively with in-basket problems. The participant, after he is given the background information and placed in a particular role, now gives his attention to and takes action on the various pieces of correspondence which comprise the in-basket exercise. The actions taken on these problems require him to exhibit knowledges and skills acquired in his past experience. In taking action, the participant, on a separate piece of paper, states what kind of action he is taking and why he is taking it.

In collecting problems for the in-basket test, every effort is made to secure actual material from the job that is to be simulated. There are important benefits to be derived from this procedure both in terms of face validity and content validity. Face validity is achieved when the participants feel that they are cast in a realistic job situation and confronted with the kinds of problems they will face in the actual on-the-job situation. This, in turn, enables them to become ego involved in the exercise and motivated to do their best, that is to exhibit the managerial and administrative ability they possess. Content validity, in the context of a training situation, is satisfied when actual on-the-job problems are selected for the in-basket exercise and are, in turn, related to specific training objectives. Thus, the in-basket exercise is tied in a closed loop process to the systems engineering design of courses, for both test content and training objectives are derived from a detailed analysis of the job performance requirements. In essence, the in-basket test is a job sample test incorporating certain knowledges and skills given to an officer in training which he now applies to a realistic simulation of an actual job situation.

Originally the in-basket test was developed at Maxwell Air Force Base, Alabama, to measure the effect of instruction upon job proficiency (Findley, et al 1954). From this modest beginning, the in-basket technique has been used both as a selection device and a training tool in such companies as Procter and Gamble, American Telephone and Telegraph, IBM, and the New York Port Authority. It has been used in assessment and training for both first line supervisors and middle management. In-basket tests have been constructed to measure ability in a wide variety of occupations such as production foremen, veterans' administration executives, educational administrators, executive secretaries, and police lieutenants. (Lopez, 1966)

In the US Army Signal Center and School, we used the in-basket test to measure the effectiveness of officer training in our Communications Center Operations Course. The in-basket is used as an end-of-course examination to measure the effectiveness of training throughout the entire course. The purpose of the test is to see if an officer can take the material he has learned and apply it in a practical way in order to solve problems and make decisions in a realistic simulation of an on-the-job situation.

Several key problems had to be met for the successful development of an in-basket test for this course. These problems include: selecting the course for application of the in-basket test, specifying the situation and the role in which the officer is placed, determining the amount of information to give to the officer, selecting and constructing the in-basket problems, developing the scoring system, and making sure the test is reliably scored.

The Communications Center Operations Course was selected as the course in which to develop the in-basket test. The rationale for this selection lies in the fact that the officer is being trained in this course for either of two closely related job assignments (assignment to a tactical or fixed Communications Center) not for a host of slightly related jobs each of which possesses its own unique challenges. Thus, the construction of the in-basket problems can be keyed to a specific field assignment.

A problem still existed, however, of whether to construct two in-basket tests, each representing a specific job or to somehow combine these two tests into one. The latter alternative was selected for it was felt that to use two in-basket tests would be prohibitive in terms of testing time. To make the situation as realistic as possible and to present the widest range of problems possible, it was decided to create the role position of the Officer-in-Charge (OIC) of a tactical Communications Center that was in transition to a fixed Communications Center. Thus, he was involved in moving from field vans to permanent buildings. Further realism was added to the situation by providing the officer with the kind of information he would have a real life job situation. His role situation was described together with the setting he was in and the equipment he possessed. All necessary forms, regulations, and publications were provided. In addition, he was given a personnel roster, the chain of command, a diagram of his present facility, and a diagram of his future facility. All this material with the exception of classified material was given to the officer the night before testing to insure his becoming thoroughly familiar with the role, the background situation, and the test requirements.

Specific instructions given to the officer prior to taking the in-basket test require him to be in his place of work and to take action on the papers, memos, and forms in his in-basket. Each problem has to be solved and all necessary action has to be recorded on proper forms in accordance with applicable regulations. If he wants to delegate certain routine actions to subordinates, he has to designate which subordinate, why that subordinate, and give him detailed instructions on the actions to be accomplished. Thus, the items are structured in such a way as to force him to take action. He is placed into a decision-making situation and the quality of his decisions can be evaluated.

As a first step in construction of the in-basket test, instructors were asked to select the most critical training tasks for each of the six phases of the Communications Center Operations Course. These phases are: Logistics and Personnel, Tactical Communications Centers, Tape Relay, Automatic Data Processing, AUTODIN, and Fixed Communications Centers. The in-basket problems will reflect these training tasks. Visits were made to Communications Centers both at Fort Monmouth and in Philadelphia to observe the day-to-day activities of the Center and to collect material that would be suitable for development of in-basket problems.

From these activities and from the experiences of the teaching personnel, five problems were developed for the in-basket test. The first problem deals with COMSEC logistics and facility approval and has the officer in transition from a tactical to a fixed station Communications Center. He is required to order fixed station equipment, documents, set up required security measures, and obtain security approval. The next problem is an inspection problem in which the officer has to brief his Commanding Officer on the frequency and criteria for a COMSEC inspection and also the Command responsibility with regard to the inspection. The third problem deals with a COMSEC insecurities problem in which there was unauthorized techniques used in encoding a message. The OIC is required to determine the type of insecurity and affix responsibility, make a proper report of the security violation, and recommend corrective action.

In the fourth problem (COMSEC accounting), he is issued an actual box of CRYPTO material and has to sign for it, inventory what is in the box, check to make sure all the documents are complete, report on any missing material, and destroy duplicated material.

The Standard Operating Procedures (SOP) problem is the final problem in the in-basket test. It requires the OIC to construct an SOP in outline form for a new system of wide band terminals to be installed in the Commanding General's office.

In all of these problems, the officer is given the same kind of information he would have if he were on the actual job. He is not told what course of action to take and then graded on how well he carries out these actions. Rather, he has to analyze the problem, determine the correct course of action to take, and describe how he would carry out these actions to the desired ends.

Additional realism is gained when these problems are presented on actual Army forms such as routing and transmittal slips, disposition forms, COMSEC material report forms, cryptographic message forms, etc.

The officer deals with each problem by completing the required forms which he obtains from a table on which all the forms he will need to complete the test are assembled together with certain distractor forms which have no useful purpose in this test. He also has a supply f paper available for recording decisions and carrying out actions that are not readily tied to particular forms. These written responses serve as a basis for judging his problem solving and decision making ability.

Each in-basket problem has several correct decisions to be made and courses of action to be taken. It is scored on a nine-point scale with anchor points being established along the scale at points 1, 3, 5, 7, and 9. A judgment is made as to which decisions for a given problem are the crucial ones and these are given more weight when the solutions to the problem are scored. Thus for a given problem, a person would receive 9 points if everything was correct, 7 points if only a few minor decisions and actions were not taken, 5 points if all critical decisions and actions were taken but minor decisions and actions were not taken, 3 points if some of the critical decisions and actions were taken, and 1 point if only minimal work was performed on the problem.

A panel of judges who are subject matter experts specify the quality range of decisions and actions for each problem. These are assembled into an administrator's manual so that the scorer, in evaluating a participant's solution to a problem, compares his response to the point on the scale to which it more closely corresponds and assigns the resulting value as the score for that problem.

Before the in-basket test can be put into operational use, scorer reliability has to be determined and, in fact, should be perfect, that is, three or four scorers should score a participant's in-basket test independently and their evaluations should agree. If they do not agree, which is typically the case when the in-basket test is first scored, discussion should be held among the scorers to discover the points of difference and to resolve these differences. Once the scoring techniques have been refined, the administrator's manual should be updated to reflect these changes. This procedure will allow scorers, who use the administrator's manual as a guide, to objectively score the in-basket test.

Thus far, my presentation has been concerned with the use of the in-basket test as a tool to evaluate ability to be trained as a Communications Center Officer. It has other uses. Parts of it can be given as a diagnostic tool during various phases of a course so as to discover student deficiencies in mastering course content. This information could lead to a rewriting of the Program of Instruction to stress certain concepts that the students have difficulty grasping. Feedback on the results of the in-basket test can be given to trainees

so that they can gain valuable insights into their managerial and administrative behavior. Also, they can get an idea of their strong and weak points in the areas of problem analysis and decision making.

In closing, it seems to me that the in-basket test, by providing a realistic sample of the kinds of job skills and knowledge expected of trainees, may be profitably adopted by other service schools who seek a more meaningful way to assess the expected managerial and administrative behavior of their graduates.

References

Findley, W. G., Frederiksen, N., and Saunders, D. R. An analysis of the objectives of an executive-level educational program. Maxwell Air Force Base, Alabama: ARDC, Human Resources Research Institute Technical Research Report No. 22, January 1954.

Lopez, F. M., Jr. Evaluating executive decision making. AMA Research Study 75. New York: American Management Association, 1966.

Questions and Discussion Following Dr. Kroen's Presentation

Q. When the student response is scored or graded does the student have an opportunity for discussion? Is there any negotiation of grades?

A. There is about an hour's discussion after the in-basket test. The student does have a chance to reclama. After a period of time the solutions are pretty well established. Initially, modifications have to be made in the scoring because you never really come up with all the contingencies and solutions that can be generated.

Q. How did you establish your standards for grading?

A. Strictly arbitrary. The five out of nine on the nine-point scale translates to 70 percent. We could make the scale any value such as 80 points.

Q. What constitutes satisfactory? What criteria do you use?

A. For example: in determining a security leak for an improperly sent message, there are four or five decisions that an officer has to make. The experts will generally agree on what the critical decisions are. There are other decisions that are not so critical but should be made. You can get into a corner by trying to make too fine a gradation. What we try to do is have a dichotomy. One group of decisions are those which are absolutely critical and important. Other groups of decisions are extensions of the critical decisions; in other words, things which would have to be carried out to have an absolutely successful problem. So what you do is to determine which decisions are absolutely critical and which are needed but not absolutely critical. For example, if there are five decisions to be made and three are critical, these three would equate to five on the nine-point scale and the remaining minor decisions would be used to determine the extra points from five to nine on the scale. If he misses one of the critical decisions he would get less than five.

Q. What happens in real life when you make a mistake on something like that is that you end up with a bunch of nonconcurrences. In effect you could go to your subject matter experts and ask, "Do you concur or nonconcur?" If you get a bunch of nonconcurrences, the thing can end up back in the student's lap. That is what happens in real life and the student can then resolve that problem. It would seem that that would be an effective soft sell of the scoring system.

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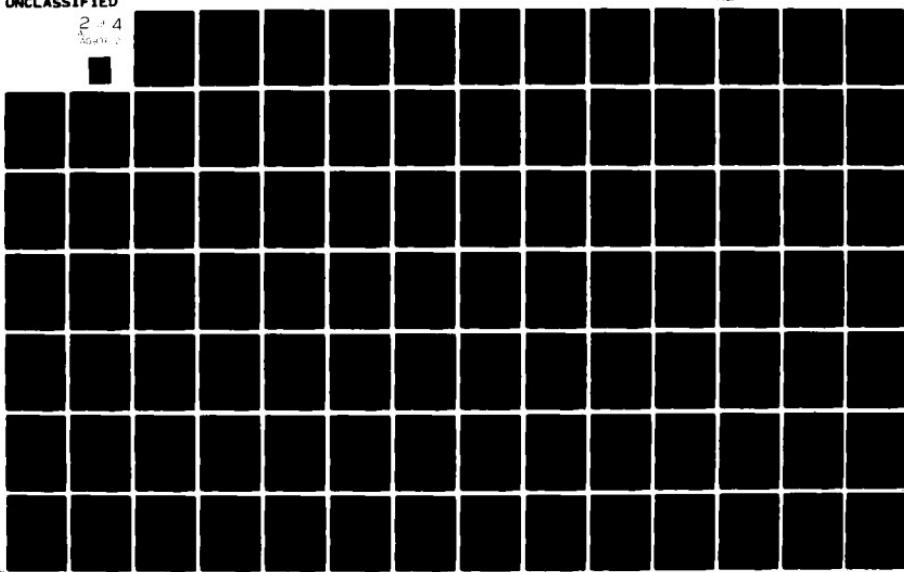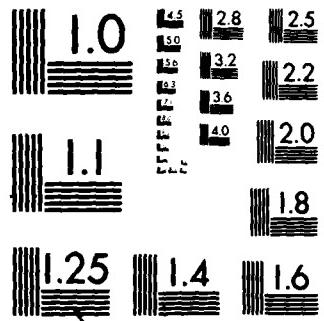
MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

A. Yes. That is true. One of the things we do is to require the student to pick up a package of classified material. He has to inventory the material and see what is there. If anything is missing there are certain type reports he has to make. If there are duplications there are certain type reports required. If he is going to sign for a package he has to make sure that the package has not been tampered with. We have packages all made up and the student is brought into the room to sign for the packages. He is observed to see if he checks for tampering and so forth. If he just signs without checking that is not good enough.

Q. You use the in-basket as a test. What method of teaching do you use to lead up to and get the student ready for this type of test?

A. The way we usually teach our officer courses is to present the material in lectures and conferences and then test him, usually, with multiple choice type questions. You are not really challenging him with any kind of problems or actual job situations. Then he gets out in the real world and faces the real world situations through the type of problems we are talking about here. What we want to do is check his ability to solve these real world problems.

Q. In your in-basket test do you try to test the officer's programming or process skill? Are you concerned with the method with which he solves the problems?

A. Not really. You are talking about the method with which a student arrives at a certain decision. We are not concerned with the method he uses. We are concerned with whether or not he does it at all. I am not sure in my own mind (in spite of some of the speakers yesterday) that we are at a point in our technology that we can teach process. We have to teach content first. After this is learned then maybe we can turn our attention to teaching process.

Q. Do you use the test as a diagnostic and prescription device?

A. We have not really explored its use as a diagnostic tool although I think it could be used for that. Of course the wrong responses can be identified but to find out what led the student astray would require some interaction between the student, the instructors, and possibly other students. It could be that instruction was vague or that the student is doing things wrong or not enough time was allowed for certain areas. These types of things have to be looked into.

Q. Do you have immediate feedback with the in-basket test?

A. Yes. When I talk about feedback I mean that immediately after
the officer takes his test there is a critique session where they
go over the problems and all the decisions and the why of the
courses of action and what is right and what is wrong. The students
feel that the exam is not Mickey Mouse and that the exam does bear
out what they should do. It correlates with what officers do in
other kinds of situations. They feel that it is a worthwhile and
realistic test.

CONARC SOFT SKILL TRAINING CONFERENCES
Learning Centers

Clarence C. Newsom
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Major Stanfield of the Infantry School at last year's training
conference gave a very fine report on that school's Individual
Learning Center. He discussed their experience with selection
of hardware, development of software and operation of the facility.
Attempting to avoid undue duplication, I will tell you about our
experience with the Learning Center at the Aviation School. I'd
like to emphasize that we do not claim to have the ultimate answer,
but we are pleased with the results of the facility. I will also
tell you a little about the learning centers at Forts Wolters and
Benning.

The use of learning centers at service schools first came to our
attention when, in January of 1969, the Primary Helicopter School
at Fort Wolters opened one for Vietnamese students. That venture
was such a success that one was opened for American students in
January of 1970. By this time, we were seriously interested in
determining if such a facility would be of value to the Aviation
School. We began a study of our situation and visited the center
at Fort Wolters and those at some Air Force and Navy installations.

At Fort Rucker, we teach a wide variety of courses ranging from
Warrant Officer career courses and Aviation Medical Officer courses
through initial entry and graduate flight courses to enlisted
specialists and mechanics courses. The learning environment ranges
from modern multi-media classrooms, renovated World War II buildings,
open hardstands, radar and flight simulators to airborne cockpits
spread over an area of about 60 by 40 miles.

A basic decision was made to establish a learning center for the
purpose of providing remedial and supplemental instruction of an
individual basis, supporting specific courses. Initially, the main
effort was to support the instrument phase of the initial entry
flying course. Support to other courses was planned to be phased
on a priority basis. The decision to support instrument training
as first priority was based on:

   1. An analysis of flight and academic performance data which
indicated this was a problem area in what we consider to be our "bread
and butter" flight course.

2. The tasks being learned were largely procedural in nature
and lent themselves to individualization.

3. A number of programed texts, training aids, and devices were
available to support the training.

4. Students in the course were indoctrinated in using the learning
center at Fort Wolters.

Personnel to operate the center and to develop individual lessons came
from "our hide." Staffing is still a major problem in that we recognize
a need for 24 people and just this year we were authorized six on the
TDA. The staff is divided into a Lesson Development Section and a
Training Section.

The learning center was, and still is, housed in an air conditioned
recreation hall type building convenient to student living quarters.
It was made as attractive and confortable as possible through the
"self-help" program---materials and paint furnished by the engineers
and labor furnished by the staff.

We were cautious in buying equipment because of lack of experience and
the firm belief that hardware was a little value without effective
learning programs. I will not discuss selection of hardware because
I believe you should select what is needed for your particular situa-
tion. Let it be known that you are interested and you will have a
proliferation of brochures, catalogs, and salesmen.

The USAAVNS Learning Center opened in January, 1971, equipped with:

1. Study carrels.

2. Slide and movie projectors.

3. Tape recorders.

4. ETV on call.

5. Aircraft cockpits.

The staff attempts to provide a choice of individualized slefpaced
lessons presented by:

1. TV.

2. Sound/slide programs.

3. Tape cassettes.

4. Super 8mm film.

III-24

5. Programed texts.

6. Live instructors.

From a modest coverage of instrument subjects, we now have lessons available with a choice of media in the following areas:

1. Instruments.

2. Aircraft systems.

3. Tactics.

4. Contact flight.

5. Air traffic control.

6. Enrichment lessons.

Operating hours of the learning center are 0730-2200, Monday through Thursday; 0730-1630, Friday; and 1200-2200, Sunday. These hours were chosen as a result of a survey of students attending the facility. The study revealed that evening is the most popular time with peak attendance at 1930.

Since opening, emphasis has been on voluntary attendance, but there is provision for referral by instructors. A slip with the problem identified is given the student. He presents it at the learning center, appropriate notation is made on it and he returns the slip to his instructor. About 15 percent of those attending are referred. The remainder, of course, are volunteers. The average visitor spends about one and a half hours in the center. To encourage attendance, it was necessary to publicize. This was, and still is, done through briefings, flyers, daily bulletin, post newspaper, local radio and TV programs and any other means possible. After two years, people still "discover" the learning center!

It is apparent from the foregoing discussion that student attendance records are maintained. In addition, lesson usage records are kept. Students are also asked to complete critique forms indicating needs, preferences, and interests. These records assist in making decisions regarding operating hours, lessons to stock, methods and media.

Though not it's primary mission, the learning center serves as a laboratory for innovation. A branch facility was established at one of the base airfields to support the synthetic flight trainer syllabus in basic instrument training. Students waiting on the ground while their stick buddies were flying or in synthetic trainers were administered

programed texts designed to prepare them for their next synthetic trainer
flight. This served to increase student retention, saved instructor
briefing time, and capitalized on practical application in the trainer.
When success of this operation was established, it was transferred to
"he flight department and became a permanent part of the course. A
cockpit mock-up that was animated to show realistic instrument readings
was duplicated by a commercial firm and two of the devices are now
used as procedural trainers in a course of instruction. Experience
gained in preparing individualized programs proved to be particularly
valuable in converting three mechanics courses to the self-paced
configuration. There have been other examples and we hope there will
be more where improvements learned in the learning center can be moved
to the classroom.

Thus far, I have not addressed cost and funding. The staff requisitioned
and drew equipment where it could be found; they fabricated, improvised,
and borrowed. The command made funds available within the budget.
From support people we heard, "You can't do it, it's not on the TDA."
And from training people we heard, "It's a flash in the pan and won't
work." We did get people and materials to operate the learning center
and it has worked well. About sixty users visit the learning center
on an average day. Approximately 15 percent of the users are staff and
faculty seeking refersher training. Comments from staff and faculty
as well as students continue to be laudatory.

The education advisors at the Primary Helicopter School and the Infantry
School have furnished some recent information about the learning centers
at Forts Wolters and Benning. Both are engaged in innovations that are
interesting.

Fort Wolters is employing gaming/simulators to capture the student's
interest and to stimulate his learning. The learning center is used
as one of several specialized classrooms. Other rooms, or modules, are
fitted to support a particular subject such as navigation or map reading.

Fort Benning expanded it's learning center from 30 to 50 carrels some
time ago and this month they are moving a 131 carrel center on the
second floor of Infantry Hall. In addition to the usual equipment,
each carrel will have a student response system. They plan to expand
the review and enrichment mission to include use of the faculty for
core curriculum programs.

To those who are considering establishing a learning center, I have
some suggestions. Begin with assignment of a mission to meet your
own particular requirement. Do not duplicate our facility nor that
of anyone else. Visit, look and study, then select equipment and
programs to support your special situation.

We welcome your visit to Fort Rucker and are most happy to show you
what we have and what we are doing.

SLIDES

 1 - Aircraft, flag and sign
 2 - Vietnamese Student
 3 - Fort Rucker Gate
 4 - USAAVNS with wings
 5 - School Mission
 6 - Initial Entry Rotary Wing Student   Fort Wolters ⟶ Fort Rucker
 7 - Local Area
 8 - 1st Airfield
 9 - 2d Airfield
10 - New Classrooms
11 - U-21 and CH-54
12 - T-41
13 - Maintenance Training
14 - Synthetic Flight Training System
15 - Cockpit
16 - Radar Simulator
17 - Learning Center Mission
18 - Building
19 - Equipment
20 - Methods
21 - Lessons
22 - Interior View
23 - Interior View
24 - TV - Multiple Listening
25 - MK IV
26 - Sound Slide
27 - Procedure Trainer with MK IV
28 - Fort Wolters Mailbox
29 - Fort Wolters Building
30 - Fort Wolters Table with Programed Texts
31 - Fort Wolters Student at Carrel
32 - Fort Wolters Inside View
33 - Fort Wolters Helicopter
34 - Fort Wolters Mock-up of Cockpits
35 - Fort Wolters Sight Picture Device
36 - Fort Wolters Flight Control Device
37 - Fort Wolters Game/Simulation Title
38 - Fort Wolters TH-55 Approach Game
39 - Fort Wolters Electrical System Preflight Game
40 - Fort Wolters Student Playing Game
41 - Fort Benning Student Carrel with responder system
42 - Fort Benning Response Device
43 - USAAVNS Crest

Questions and Discussion following Mr. Newsom's Presentation

Q. We have had the problem of needing something new and getting what we need to match up with what we already have. How do you solve that problem?

A. That is one of the problems you have; making sure that your equipment is compatible. The Director of Communications-Electronics will do his best to keep you honest in this area, because each time you talk about a new piece of equipment coming into the inventory, they are going to shudder. It complicates their maintenance problem. Our experience has been good as far as maintenance is concerned. We have had very little trouble. We have had more trouble with the equipment we bought and found we had no use for. For example, we bought a Super 8mm camera with sound to make our own movies. It sounds good and looks good--but steer clear.

CONARC SOFT SKILL TRAINING CONFERENCE
Computer Simulations

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Fort Lee, Virginia

The purpose of this presentation is to introduce you to computer
assisted instruction as it is conducted at the Quartermaster School,
Fort Lee, Virginia. But, before I go into descriptions of the
various simulations, let me give you a little history.

Planning for computer assisted instruction at the QM School began in
May 1966 with a feasibility study to determine areas of instruction
that would benefit the greatest from the use of the computer. Con-
sideration was given to the expanding employment of automatic data
processing equipment in the Army's supply system and the need to
employ instructional methods that relate to this automated environ-
ment. After many months of study and preparation the School's Data
Systems Division was established and given the missions of coordinat-
ing the educational use of automatic data processing equipment and
programming. In July 1969 an intra-service support agreement with
the Army Logistics Management Center for joint use of their computer
mainframe was affected. (Slide #2) The Center's UNIVAC Series 70
computer is dedicated to educational activities. Using appropriate
elements of the feasibility study as guidelines, the School selected
remote terminal equipment and proceeded with their prototype simula-
tions. The first simulation was placed on the air in May 1971.

Currently, the School has two fully tested simulations; COSINES and
SIMTASS (Slide #3).

COSINES (Slide #4) is designed for the enlisted student who has little
or no experience in supply and emphasizes receipt, issue, reporting,
and accounting procedures detailed in AR 725-50. The simulation
supports the Stock Control and Accounting Specialist Course (MOS
76P20). Personnel who graduate from this course are qualified for
assignment to Materiel Management Centers as exception editors. As
such, they will be required to use computer generated management
information to correct erroneous input and in an emergency operate
punch card machinery.

During the course, students receive a series of instructional blocks
and comprehensive practical exercises, and are exposed to a variety
of instructional methods, including programmed text and audio/visual
(Slide #5 and 5a). At the conclusion of each block a computer-supported

exercise (COSINES) is given to further illustrate and reinforce teaching points. Each exercise is composed of a series of problems graduated in complexity and geared so that each student maintains his own dialogue with the computer, through the use of 80 column punch cards. Each student's problems are his own and have absolutely no effect on fellow students.

In COSINES, the computer is programmed to produce to each student punch card documents that contain errors. Students must make appropriate corrections and return the documents to the system. If proper corrections were made, a new document, containing different errors, will be produced. If the input document was not completely corrected, the student will receive an error notice and must make the required corrections before he receives the next problem.

An important feature of COSINES is the presence of remote input/output terminals in the classroom (Slide #6). The simulation can be conducted simultaneously in four separate locations. Terminals are connected to the computer mainframe by "half duplex" C2 rated voice grade lines. The printers are connected to the computer by "full duplex" C2 rated voice grade lines.

This photograph (Slide #7) shows a typical classroom, note the remote equipment at the front of the classroom. This is a (Slide #8) close-up of one of the IBM 1050 input/output terminal systems; on your left is an IBM 1057/1058 printing card punch. This unit provides output for the simulation and can be shifted to independent keypunching mode. The unit on your left and to the front is an IBM 1056 card reader. It feeds and reads punched cards and provides input capability. This unit, (Slide #8a) a UNIVAC 740 printer, is used to print management reports and can print up to 300 lines per minute depending on the number of characters per line.

(Slide #9) Simulations such as COSINES increase the number of transactions available to students and provide rapid responses to students in the event they input erroneous information (Slide #10).

(Slide #11) These are COSINES objectives: (Slide #12) SIMTASS is directed to senior enlisted and junior officer students. It simulates management activities required of a commodity manager in support of an independent corps under combat conditions. Students received approximately 40 hours of classroom instruction in inventory management before entering the exercise. Each manager is uniquely identified by a manager number and assigned his own separate group of items. From the time the student "signs-on" to the computer from his assigned remote terminal, until the time the simulation is ended, 16 hours later, situations are presented by a time-delay technique from the computer held scenario.

Students are confronted with decision making problems covering declaration of excesses, generation of supply directives, preparations and submission of requisitions and follow-up documents and establishment and adjustment of requisitioning objectives.

SIMTASS equipment is aligned as shown here (Slide #13). Each blue block represents a student work area. Those areas with two terminals can support five two-man teams or 10 students. Three teams or six students are usually assigned to those work areas that have one terminal.

The area in red denotes the instructor control center. The terminal shown is for instructor use only. On the other hand, the printer supports both the instructor and the student. Information requested by the instructor or the student that, when printed, will be in excess of six lines will be provided by the printer. Otherwise, all input and output is provided by the terminals. The area in yellow shows the tie with the computer main-frame (SIMTASS Title Slide #14).

The exercise has the following features that make it a good instructional vehicle:

    a. A student can advance at his own pace without affecting the progress of other students.

    b. With instructor assistance, a student can be advanced to any situation in the exercise and be taken back to any unplayed situation.

    c. The program provides the instructor with a full range of information to assist him in controlling the exercise.

    (1) The instructor terminal is notified when a student has input problems, such as format, or has selected the incorrect decision (these notices are made on the student's third try).

    (2) The computer is programmed to keep track of student progress. By inquiring, the instructor can determine the status of one or all students. He will be provided the location within the exercise, the time that the current situation was started and the total number of errors made.

    (3) In certain instances the computer will automatically provide a status report to the instructor when the student fails to follow a preferred processing sequence.

These are photographs of the SIMTASS facility:

a. (Slide #15) The Control Center. Left to right is the IBM data communication terminal and the UNIVAC 740 printer. Also in this area is a reference library and a distribution center.

b. (Slide #16) Student Work Area. Note the two IBM 1052 terminals at the front of the area.

c. (Slide #17) Close-up of a Terminal. All data communication terminals have standard typewriter keyboards. It takes approximately five minutes to prepare a student for operation of his assigned terminal.

SIMTASS objectives are shown here: (Slide #18)

(Slide #19) The QM School has these three simulations under development: All three simulations will be conducted in the same facility previously discussed for SIMTASS.

SIMWIM will (Slide #20) simulate a hypothetical inventory control point dealing in wholesale supply management, and is an adaptation of CALOGSIM, an ALMC simulation. The exercise will employ the concept of one manager having the responsibility for many items. Major and secondary items, and repair parts have been chosen so that the student is exposed to items of varying degrees of importance.

Each student will be provided a starting position on each of his items, and his sole responsibility is to establish or maintain a satisfactory supply position. To do this, he must project and realize the long-term effects of his decisions since SIMWIM is designed to cover a 4-year cycle graduated by time frames. During the simulated 4-year period the student will be exposed to a variety of problems that will effect the supply position of his items. Increased demands, natural disasters, strikes, and a war are but a few examples. The computer will automatically alert the student to changes in the status of his items. He must anticipate and respond to these changes by appropriately applying the more than 50 management decisions available to him.

Desirable features of the simulation are:

a. The exercise will be designed to accommodate individual or team play.

b. Students must live with all decisions made, but can improve his supply position through intensive management techniques.

c. Each student will receive an effectiveness score.

d. Students can work at their own pace without effecting the progress of other students.

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SIMWIM programming is approximately 90% complete. We project that system testing will begin in January 1973.

(Slide #21) Simulation, petroleum laboratory evaluation exercise (SIMPLEX) will be a simulation of petroleum product acceptability where the student is confronted with decisions as to whether a product is worthy of its intended use. By using the computer to supply laboratory analysis, the student can concentrate on how to use the results of the analysis.

As in the other simulations discussed, the instructor will be alerted to student difficulties and during the graded portion the computer will automatically monitor and grade each student. The objective of SIMPLEX is to increase the number of decisions each student must make about product acceptability, thus better preparing him for the field petroleum laboratory. Our Data Systems Division turned this exercise over to the Petroleum Department for instructor testing and OJT on 6 Nov 72. Formal airing of the exercise is scheduled for Feb 1973.

(Slide #22) Simulation, Spectrometric Analysis Exercise (SIMSAX) will be a petroleum simulation involving spectrometric oil product analysis. This involves analyzing oil samples from operating equipment, and advising operating activities of maintenance procedures indicated by the analysis. Throughout the exercise students will be required to consider; kinds of metal wear, threshold limits, and trend analysis. A portion of the simulation will be graded.

SIMSAX is currently suspended awating further information from the field due to DOD policy changes affecting the 4 branches of the military service.

(Slide #23) The installation of SIMWIM, the inventory management exercise, SIMPLEX, and SIMSAX, the petroleum exercises, will increase the number of simulations in the QM School to five.

Looking into the future, our instructional departments have determined that these areas (Slide #24) should be considered for some type of computer assisted instruction (Slide #25).

The simulations that I have discussed have enhanced the quality of instruction at the QM School. The most ideal learning combination, obviously would be one teacher - one student. Then the student receives individual attention and immediate teacher response when needed. This we cannot accomplish due to a lack of instructors. We believe that we can effectively bridge most of this gap through the use of computer assisted instruction.

LIST OF SLIDES

1. QM School Crest
*2. Photo of ALMC Computer
3. Explanation of COSINES and SIMTASS
4. COSINES Title
*5. Photo of audio/visual equipment (COSINES)
6. COSINES Equipment Alignment
*7. Photo COSINES Classroom
*8. Photo COSINES Input/Output Terminals
*8a. Photo COSINES Printer
9. COSINES Title (see 4 above)
*10. Photo of Student (COSINES)
11. COSINES Objectives
12. SIMTASS Title
13. SIMTASS Equipment Alignment
14. SIMTASS Title (see 11 above)
*15. Photo SIMTASS Control Center
*16. Photo SIMTASS Work Area
*17. Photo SIMTASS Terminal
18. SIMTASS Objectives
19. List of Developmental Systems
20. SIMWIM Title
21. SIMPLEX Title
22. SIMSAX Title
*23. QM School Crest
24. CAI Areas Under Consideration
*25. QM School Crest

*These are photographs, an explanation of each is provided below. An
example of the other slides listed are attached hereto.

SLIDE NUMBER	EXPLANATION
2.	Photo of a portion of the ALMC computer - Univac Series 70.
5.	Shot of an Audio/Visual work area showing the 35 mm projector and the screen.
7.	View from the rear of a COSINES classroom showing students at work and terminal equipment.
8.	Close-up of an IBM 1057/1058 Printing Card Punch, IBM 1056 Card Reader.
8a.	Close-up of the Univac 70 printer.

SLIDE NUMBER	EXPLANATION
10.	A Student showing disappointment.
15.	View of the IBM 1052 Keyboard Printer, and the Univac 70 Printer.
16.	View of a SIMTASS Work Area showing students at work and remote terminals.
17.	Close-up of terminal keyboard.

COSINES OBJECTIVES

1. INCREASE STUDENT PARTICIPATION IN HANDLING MILSTRAP, MILSTRIP DOCUMENTS.

2. PROVIDE CLOSE ASSOCIATION WITH AN AUTOMATED ENVIRONMENT SIMULAR TO

   FIELD CONDITIONS.

3. FAMILIARIZATION WITH KEYPUNCH PROCEDURES.

4. SUPPLEMENT AND RE-INFORCE INSTRUCTIONS RECEIVED FROM THE TEACHING

   PLATFORM.

5. INCREASED STUDENT MOTIVATION.

Slide 11

SIMTASS OBJECTIVES

1. SELECTIVE MANAGEMENT AND MANAGEMENT BY EXCEPTION.

2. ILLUSTRATE THE RIGID DISCIPLINES OF AN AUTOMATED ENVIRONMENT.

3. SUPPLEMENT AND REINFORCE INVENTORY MANAGEMENT INSTRUCTIONS RECEIVED FROM

   THE PLATFORM.

4. PROVIDE STUDENTS WITH ACTUAL HANDS-ON FAMILIARITY AND EXPERIENCE

   WITH REMOTE INPUT/OUTPUT DEVICES.

Slide 18

SYSTEMS UNDER DEVELOPMENT

1. SIMWIM - SIMULATION, WHOLESALE INVENTORY MANAGEMENT.

2. SIMPLEX - SIMULATION, PETROLEUM LABORATORY EXERCISE.

3. SIMSAX - SIMULATION, SPECTROMETRIC ANALYSIS EXERCISE.

Slide 19

PROJECTS UNDER CONSIDERATION

1. CLUB MANAGEMENT

2. DLOGS (DIVISION LOGISTICS SYSTEM)

3. SAILS (STANDARD ARMY INTERMEDIATE LEVEL SUPPLY SUBSYSTEM)

4. STORAGE AND WAREPROCEDURES

5. PETROLEUM PIPELINE CONSTRUCTION

6. FINANCIAL MANAGEMENT

Slide 24

Questions and Discussion Following Major Meacham's Presentation

Q. You mentioned six terminals and then you said the simulations are individually paced. Does that mean that you can get six displays off of one terminal?

A. No. We have eleven terminals. In each work area there are ten individuals and two terminals. There are five work groups in each work area. We work in teams for communications purposes but each team stands alone.

Q. Does each student or team have a code number?

A. Yes. Each team has a code number that is identified to the computer. He signs on for example as Team A 1. In any given work area no more than one team will be working on the same problem.

Q. Do you have any projection of the comparable cost of totally utilizing this system or are you doing some things with this system which you could not do with other systems?

A. We are doing things that we could not do without the computer. One of the main objectives is to allow the student to operate as close to the real environment as possible. We don't duplicate what the computer does by letting the student do it. In depots, in supply, in supply management, the computer does most of the work. The student works on the exceptions.

CONARC SOFT SKILL TRAINING CONFERENCE
Results of the SMMART Army Training Survey

Harold L. Moon
HumRRO Division No. 2
Fort Knox, Kentucky

CONARC has been interested for a long time in developing a reliable
procedure for selecting the most satisfactory training methods and
media, and HumRRO Division 2 at Fort Knox began a Work Unit called
MEDIA two years ago in 1970. Later, in 1971, Work Unit COST was
also begun. COST was to develop training cost-analysis procedures.

An exploratory study in MEDIA attempted to identify an empirical
basis for a methods-media selection manual. This was done by a
survey of the literature. The results showed that neither suitable
guidelines nor sufficient empirical data exist which can be used for
a reliable methods-media selection procedure.

Therefore, in December of 1971 -- after a HumRRO - CONARC conference
on work units MEDIA and COST -- the two units were combined into an
expanded program, now called Work Unit SMMART, which stands for
Developing Criteria for the Selection of Methods and Media by Army
Trainers.

The work on training cost is proceeding well, and that's all to be
said about it today, because we are concerned in this conference
with methods and media. So remaining remarks will be about what we
have done in Work Unit SMMART toward development of a methods-media
selection procedure and what remains to be done.

Last spring we prepared a Draft Technical Report on The State of
Knowledge pertaining to The Selection of Cost-Effective Methods
and Media, which is now being edited for publication. We also pre-
pared a research plan for determining an empirical basis for the
selection of media, which would require several years to complete.
Meantime, if we didn't do something else, the Army would be without
anything from HumRRO to help in selecting methods and media. So as
part of the research plan, we proposed to develop in a relatively
short time a selection procedure based on the experience of quali-
fied Army training personnel.

To do that, we followed the lead of R.W. Walker of the MARTIN-
DENVER COMPANY on an approach he reported in the Human Factors
journal. The steps in Walker's approach are on the first page of
the handout materials. Walker first asked his training staff to
list criteria they used in selecting methods and media. Then he
asked them to list the methods and media they use or thought might
be useful in training. Finally, to determine the value of the

methods and media, he asked his training personnel to rate each method and medium in relation to each of the selection criteria they listed. The ratings were done on a five-point scale, with 5 being the highest value and 1 the lowest. Then Walker averaged the ratings of each method and medium for each criterion. This gave him a consensus value for each method and medium, based on his trainers' judgments.

Although Walker's project was rather skimpy, we decided that his approach has good potential if thoroughly and carefully developed. This is what we proposed to do for the Army, with the cooperation of qualified Army training personnel.

As the first step in applying this approach, we prepared a training survey questionnaire.

The questionnaire had several purposes. One was to identify Army training personnel by name, school, job title, job function or functions, and type of experience with Army training. Another purpose was to get a list of criteria used in the Army for selecting methods and media, and a third was to learn which methods and media Army training personnel use, have used or would use if they had the opportunity.

CONARC sent out a total of 483 questionnaires -- 21 of each of 23 CONARC schools. Of these, 443 were completed and returned from 21 schools. None were received from the Chaplain School and the Infantry School because they apparently did not receive the questionnaire. To those of you who participated in this survey, we heartily thank you for your splendid cooperation.

Of the 443 completed questionnaires received, 15 were not usable because they were from persons involved only in basic, or entry, training -- and we are concerned in this project with only the three levels of courses which follow entry training. In these levels, we are also interested in both hard- and soft-skill courses. These three levels and two types of skills make up the six Army course types as defined in Regulation 350-100-1 -- the regulation on development of training systems.

The six Army course types are Level I hard- and soft-skill courses for students who have had entry training; Level II hard- and soft-skill courses for students who have had Advanced Individual (AIT); and Level III hard- and soft-skill courses for students who have had unit experience.

The questionnaires represented 423 persons whom we were able to classify into four major categories. These categories were instructors, supervisors, systems engineers, and educational advisors.

We were also able to classify the 428 persons according to the three course levels and the hard and soft skills which divided the individuals into the following 12 categories.

    28 were involved with hard skills on course Level I;
     9 with hard skills on Level II;
    11 with hard skills on Level III;
    39 were involved with hard skills on all three course levels.
    12 worked with soft skills on Level I;
     3 with soft skills on Level II;
   117 with soft skills on Level III; and
    91 with soft skills on all three course levels.
    12 worked with both hard and soft skills on Level I;
     2 with hard and soft skills on Level II;
    13 with hard and soft skills on Level III; and
    91 with both hard and soft skills on all three course levels.

We further analyzed the information received in the questionnaires for purposes which will be stated as we move along.

First we noted that a total of 29 criteria for the selection of methods and media were listed by respondents. These are shown in Table 1 (see page III-55).

On the right of the table are the percentages of the 428 individuals who listed each criterion, starting with 55 percent at the top down to one at the bottom of the column. These percentages were used for ranking the criteria. The ranks are in the column of figures on the left side of the table. One at the top represents the criterion most frequently mentioned, and 28.5 at the bottom represents the two criteria least frequently mentioned. Since they had the same frequency, they were tied for lowest rank. You will note that there are other tied ranks in the column.

Both the percentages and ranks represent all the 428 respondents. As you might expect, however, there were some differences in the percentages, and therefore in the rankings of the criteria, between the various groups of Army training personnel represented by the questionnaires. Because of these differences, it was important for us to know how well the groups agreed on the criteria.

Table 2 shows on the left the groups we compared to see how well they agreed on the rankings. Note first that these groups were classified according to skills, course levels, and main job functions with which the respondents were involved.

TABLE 2

SELECTION CRITERIA - GROUP RANKING COMPARISONS

GROUPS	COEFFI-CIENT	x^2	SIGNIF. 28 d.f.
SKILLS			
HARD - SOFT - BOTH	.937	78.71	>> .001
COURSE LEVELS			
I & II - III	.913	76.69	>> .001
MAIN JOB FUNCTION			
INSTRUCTORS - SUPERVIS. - SYSTEMS ENG.	.947	79.55	>> .001

In the skills category, we compared three groups: those involved with hard skills only; those involved with soft skills only; and those involved with both hard and soft skills.

In the course-level category, we compared two groups: those involved with courses on Levels I and II; and those involved with Level III courses. Levels I and II were combined, because there were only five persons in Level II.

In the Main-Job-Function category, we compared Instructors, Supervisots, and Systems Engineers. In this case, Educational Advisors were included in the supervisor group.

We used the Kendall Concordance Test to see how well the groups agreed on their rankings of the methods and media selection criteria. This test yields a rank correlation coefficient.

As you can see, the correlation coefficients for the groups in the three categories are .937, .913, and .947 -- all of which are very high.

To test the significance of the correlation coefficients, we calculated Chi Square values, which were also very high; all were significant at levels far better than .001 level of confidence.

Another way to interpret these results is to conclude that the groups compared came from a homogenous population -- or from the same population.

So much for the methods and media selection criteria as obtained by the questionnaires.

Now about the methods and media information. The questionnaire contained a list of 102 methods and media, and the respondents were asked to check those they use, have used or would use in Army training.

The information was quite useful for several purposes. First, we were able to identify the frequencies at which various groups checked the items. This is important, because we assume that higher frequencies indicate those groups which probably have higher degrees of experience in training. We assume also that the higher frequencies indicate a greater awareness of methods and media, and we hope that, if our assumptions are correct, the higher degrees of experience, and awareness of methods and media, also indicate higher degrees of training expertise.

To determine meaningful frequencies for comparing groups, we first calculated mean percent frequencies for six groups, as shown in Table 3.

TABLE 3

METHODS-MEDIA PERCENT FREQUENCIES

SKILLS		COURSE LEVELS	NO. OF RESPOND.	MEAN PERCENT FREQ.	STAND. DEV.
1.	HARD	DIFF.	48	51	25
2.	HARD	ALL	39	51	27
3.	SOFT	DIFF.	132	58	22
* 4.	SOFT	ALL	91	60	22
5. HARD - SOFT		DIFF.	27	51	24
* 6. HARD - SOFT		ALL	91	65	20
		TOTAL	428	58	22

The first group represents 48 respondents who were involved with hard skills in the different course levels. That is, we put all those who work with hard skills separately in Level I, Level II, and Level III in this Group 1.

Group 2 is made up of 39 individuals who work with hard skills in all three course levels.

Group 3 are the 132 persons who work with soft skills separately in the three different course levels.

Group 4 are the 91 persons involved with soft skills in all three course levels.

Group 5 are 27 persons who work with both hard and soft skills but in the different course levels; and

Group 6 are the 91 persons who work with both hard and soft skills in all three course levels.

The mean percent frequencies were derived by adding up all the times each member of a group checked each of the 102 methods and media in the list you have in the handout materials, and then by dividing the sum by 102, the number of items.

The results show the average percentage of the number of times each of the 102 items was checked by the members of each group.

The bottom line in Table 3 shows the mean percent frequency for all 428 respondents, which is 58.

Now note that only two groups -- 4 and 6 -- have a mean percent frequency higher than the overall mean percent frequency of 58. Three are below the overall mean, and one is the same as the overall mean.

We are interested in the two groups which have a mean percent frequency above the overall mean -- Groups 4 and 6.

Therefore, as stated earlier, we assume that Group 6 contains at least some individuals who have a higher degree of training experience than other persons in the overall population of 428. This assumption is also reasonable, especially for Group 6, for members of that group work with both hard and soft skills in courses on all three levels of training.

As with the methods and media selection criteria, we had to find how well these groups agreed on their relative frequencies of checking the methods and media items. Without doing this, we would have no basis for confidently proceeding further.

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TABLE 4

METHOD-MEDIA GROUP RANKING COMPARISONS

SKILLS		COURSE LEVELS	NO.	RHO COEFF.	t-Value	100 d.f. t-Value .01 Level
1.	HARD	DIFF.	48	.933	25.833	2.626
2.	HARD	ALL	39			
3.	SOFT	DIFF.	132	.888	19.287	2.626
4.	SOFT	ALL	91			
5. HARD & SOFT		DIFF.	27	.796	13.131	2.626
6. HARD & SOFT		ALL	91			
12 OTHER COMBINATIONS				.666 to .939	8.823 50 27.061	2.626

Table 4 shows the same groups as in Table 3, but the added data are rank correlation coefficients for comparing the groups and t-test values as checks on the significancies of the correlations.

We checked not only the correlations between the pairs of the six groups but for the 12 other possible combinations of those groups. As you can see, the coefficients range from .666 to .939. The t-values also are highly significant. A t-value of only 2.626 is required for significance at the .01 level of confidence, and the t-values obtained are significant at least at the .001 level of confidence.

So, as with the selection criteria, we concluded with high confidence that all the groups are from the same population; all are in high agreement.

Now we must get back to Groups 4 and 6 in Table 4 which we identified as probably containing persons who have the highest degrees of training experience.

It is important to identify these persons, at least by major job function, because we need their cooperation as Army training experts in the next step of our research. As Walker did with his training staff, we need them to rate the methods and media in relation to the methods and media selection criteria.

In our search for the training experts, we must turn to the four groups we identified according to major job function -- the Educational Advisors, Systems Engineers, Supervisors, and Instructors.

TABLE 5

GROUPS FOR COMPARING METHOD-MEDIA RANKS

JOB FUNCTIONS	NO. FROM GROUP 6	NO. FROM GROUP 4	TOTAL NO.	NO. LEFT IN GROUP 6
ED. ADVISORS	12	5	17	79
SYSTEMS ENG.	13	4	17	78
SUPERVISORS	14	3	17	77
INSTRUCTORS	8	9	17	83

These groups are shown in Table 5. The total of Educational Advisors was only 17. We found 12 of them in our highly prized Group 6, and 5 in the next best group - Group 4.

To make fair comparisons between the advisors, engineers, supervisors and instructors, we selected 17 representative members of all groups because there were only 17 Educational Advisors. We got all the persons in each group that were in Group 6, and selected the remaining number at random from Group 4.

Notice that in the column on the far right are the number left in Group 6 after selecting out the members of the occupational groups.

TABLE 6

METHODS-MEDIA GROUP PERCENT FREQUENCIES

GROUPS	NO.	MEAN PERCENT FREQ.	STAND. DEV.
ED. ADVISORS	17	84	12
GROUP 6	79	61	22
SYSTEMS ENG.	17	77	16
GROUP 6	78	66	22
SUPERVISORS	17	61	26
GROUP 6	77	66	19
INSTRUCTORS	17	49	24
GROUP 6	83	64	19
ALL RESPONDENTS	428	58	22

Table 6 shows the mean percent frequencies of all the groups under consideration.

Note that Educational Advisors have the highest mean percent frequency of 84. Systems Engineers have the next highest mean percent frequency of 77.

If our assumption is correct that higher mean percent frequencies of checking methods and media indicate higher degrees of training experience, and if our hope is not in vain that they also indicate greater training expertise -- then clearly, Educational Advisors probably are the top experts we seek, with Systems Engineers close runners up.

To find out the lowest number of Educational Advisors or Systems Engineers we can use as experts for rating methods and media in relation to methods and media selection criteria, we first selected at random two groups of Educational Advisors and two groups of Systems Engineers with five in each group and compared them by calculating rank correlation coefficients.

TABLE 7

COMPARISON OF ED. ADVISORS AND SYSTEMS ENG.
GROUPS OF FIVE EACH

GROUPS	NO.	RHO COEFF.	t-Value	100 d.f. t-Value .01 Level
ED. ADVISORS (1) ED. ADVISORS (2)	5 5	.590	7.301	2.626
SYSTEMS ENG. (1) SYSTEMS ENG. (2)	5 5	.397	4.330	2.626
FOUR OTHER COMBINATIONS		.410 to .534	4.500 to 6.322	2.626

Table 7 shows the results. All the coefficients ranged from .397 to .590. The .397 coefficient may seem low, but we can see by its t-value that the significance is better than the .01 level of confidence.

To push the test of possibility to the lower limit, we selected at random two groups of Educational Advisors and two groups of Systems Engineers with only two persons in each group.

TABLE 8

COMPARISON OF ED. ADVISORS AND SYSTEMS ENG.
GROUPS OF TWO EACH

GROUPS	NO.	RHO COEFF.	t-Value	100 d.f. t-Value .01 Level
ED. ADVISORS (1) ED. ADVISORS (2)	2 2	.199	2.026	2.626
SYSTEMS ENG. (1) SYSTEMS ENG. (2)	2 2	.032	0.318	2.626

Table 8 shows the results. The coefficients are very low and neither is significant at the .01 level of confidence, which we feel is necessary if we are to get reliable ratings of the methods and media.

We decided to make one more comparison, this time with three persons in each group.

TABLE 9

COMPARISON OF ED. ADVISORS AND SYSTEMS ENG.
GROUPS OF THREE EACH

GROUPS	NO.	RHO COEFF.	t-Value	100 d.f. t-Value .01 Level
ED. ADVISORS (1) ED. ADVISORS (2)	3 3	.552	6.626	2.626
SYSTEMS ENG. (1) SYSTEMS ENG. (2)	3 3	.361	3.871	2.626
ED. ADVISORS (1) * SYSTEMS ENG. (2)	3 3	.082	0.825	2.626
THREE OTHER COMBINATIONS		.358 to .468	3.839 to 5.316	2.626

As shown in Table 9, all the correlation coefficients were significant at the .01 level except one -- the .082 coefficient for Educational Advisors and Systems Engineers.

So we decided to be safe and not settle for less than groups of _five_ Educational Advisors who have consistently shown up in our data as the best single group.

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This does not mean that we need only five Educational Advisors. It means that three or four groups of five men can share the work, if they are willing, which will make the burden relatively easy to bear.

Involved in the next step are the ranking of selection criteria and the rating of methods and media to be done by Education Advisors.

SMMART HANDOUT MATERIALS

R. W. Walker's Approach*

I. He first asked his training staff to
list the criteria they used in
selecting methods and media.

II. Then he asked them to list the methods
and media they used or thought might
be useful in training.

III. Then he asked his staff to rate each
method and medium in relation to
each of the selection criteria they
selected (on a five-point scale).

IV. Then Walker averaged the ratings for
each method and medium, to get a
consensus value for each, based on
his trainers' judgments.

(* Walker, R. W. "An Evaluation of Training Methods and
their Characteristics," Human Factors, 1965, 7, pp 347-354.

NUMBER OF QUESTIONNAIRE RESPONDENTS
IN SKILL AND COURSE-LEVEL CATEGORIES

28 - Hard Skills, Course Level I

 9 - Hard Skills, Course Level II

11 - Hard Skills, Course Level III

39 - Hard Skills, all Course Levels

12 - Soft Skills, Course Level I

 3 - Soft Skills, Course Level II

117 - Soft Skills, Course Level III

91 - Soft Skills, all Course Levels

12 - Hard & Soft Skills, Course Level I

 2 - Hard & Soft Skills, Course Level II

13 - Hard & Soft Skills, Course Level III

91 - Hard & Soft Skills, All Course Levels

Total: 428

TABLE 1

Rank	Criteria	Percentage Of Population
1	Realism	55
2	Experience Level of Student	42
3	Complexity of Subject Matter - Task	34
4	Ease of Administration	31
5.5	Equipment Availability	30
5.5	Time	30
7	Training Aid Availability	28
8	Effectiveness	27
9	Cost	25
10	Facilities - Transporting Training Aid	24
11	Student Interest	23
12	Ease of Instruction - Simplicity	18
13	Class Size	17
14	Task Criticality	15
15	Student Participation	14
17	Cost-Effective	12
17	Relevance	12
17	Number of Supporting Personnel	12
19.5	Durability - Length of Service	11
19.5	Instructor Qualifications	11
21	Number of Teaching Points to Which M/M Apply - Adaptability	9
22	Sense Channel	7
23.5	Class Frequency	4
23.5	Safety	4
26	Ease of Evaluation	3
26	Platform Manhours	3
26	Instructor Preference	3
28.5	Cost of Development	1
28.5	Student-Instructor Ratio	1

PART III

METHODS AND MEDIA LIST

Directions

Please consider the methods and media listed below, and check them if you use them, have used them, or would use them for Army training.

Methods and Media

	(Check)			(Check)	
1.	___	Actual equipment	24.	___	Conference
2.	___	Advance sheets	25.	___	Correspondence study
3.	___	Animated cartoons	26.	___	Cross sections
4.	___	Bar charts	27.	___	Demonstrations
5.	___	Block diagrams	28.	___	Diagrams
6.	___	Cartoons	29.	___	Discussion sessions
7.	___	Case studies	30.	___	Exhibits and displays
8.	___	Cassette TV	31.	___	Expert panels
9.	___	Chalkboard	32.	___	Exploded views
10.	___	Charts	33.	___	Film, 8mm, sound
11.	___	Closed-circuit TV	34.	___	Film, 8mm, silent
	CAI:	Computer Assisted Instruction	35.	___	Film, single concept
			36.	___	Film, 16mm
12.	___	CAI: general	37.	___	Filmstrip, silent
13.	___	CAI: drill and practice	38.	___	Filmstrip, sound
14.	___	CAI: practice	39.	___	Flannel board
15.	___	CAI: problem review	40.	___	Flow charts
16.	___	CAI: disgnosis and prescription	41.	___	Graphics
			42.	___	Guest speakers
17.	___	CAI: tutorial	43.	___	Hand-out sheets
18.	___	CAI: gaming	44.	___	In-basket simulation
19.	___	CAI: simulation	45.	___	Instructor
20.	___	CAI: fact-finding	46.	___	Job experience training (hands on equipment)
21.	___	CAI: computation			
22.	___	CAI: logical problem solving	47.	___	Laboratory work
23.	___	CAI: exploring			

Methods and Media (Continued)

(Check)   (Check)

Language Laboratory: 76. ____ Radio

48. ____ Language Lab: general   77. ____ Realistic drawings

49. ____ Language Lab: audio   78. ____ Record player
         active   79. ____ Relief maps

50. ____ Language Lab: audio   80. ____ Reference books
         passive
                                  81. ____ Role playing
51. ____ Language Lab: audio-
         active-compare   82. ____ Sand table

                                  83. ____ Schematics

52. ____ Lectures   84. ____ Self confrontation

53. ____ Line drawings and views 85. ____ Seminar

                                  86. ____ Skeletal views
54. ____ Line graphs
                                  87. ____ Sketches
55. ____ Lists of key words
                                  88. ____ Simulators
56. ____ Magnetic board

57. ____ Manuals   89. ____ Slides

58. ____ Maps (two dimensional)   90. ____ Sound-on-Slide

59. ____ Microfilm   91. ____ Student response units

60. ____ Microprojectors   92. ____ Summary sheets

61. ____ Microteaching   93. ____ Tachistoscope

62. ____ Models   94. ____ Tape recorder

63. ____ On-the-Job Training   95. ____ Teaching machines

64. ____ Opaque projection   96. ____ Television

65. ____ Organization charts   97. ____ Terrain boards

66. ____ Overhead projector   98. ____ Textbooks

67. ____ Photographs   99. ____ Training devices

68. ____ Pictures (printed)   100. ____ Tutorial method

69. ____ Pie charts   101. ____ Venetian blind

70. ____ Posters   102. ____ Videotape (recording
                                          and playback
71. ____ Practical exercises   capabilities)

72. ____ Peer instruction

73. ____ Printed materials

     PI: Programed Instruction

74. ____ PI: branched type

75. ____ PI: linear type

Summary of Discussion of Mr. Moon's Presentation

Much discussion was generated during Mr. Moon's presentation particularly concerning the structure of the questionnaire which HumRRO had sent to the service schools to obtain information and data for Work Unit SMMART. Most of the conferees were in general agreement that the questionnaire asking what method and media the respondents <u>had used</u>, <u>were using</u>, or <u>would use</u>, was too open-ended and subject to speculation and subjectivity rather than an objective answer. Since no conditions were established for the use or possible use of the method or media many of the respondents assumed that if conditions warranted it, the method or media would be used. It was felt that this lack of specificity probably inflated the frequencies of selection for the various methods and media. It was pointed out that the questionnaire would probably have served its purposes better if the questions had related only to the past and present and omitted the future since many of the respondents, in projecting into the future, speculated that conditions in that future may be such that the use of the method or media would be warranted.

CONARC SOFT SKILL TRAINING CONFERENCE

FORT BLISS, TEXAS

12-13 DECEMBER 1972

Sponsored by

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US Army Air Defense School

Final Report - In Five Volumes

VOLUME IV

Training Quality Control Workshop

MAJOR GENERAL IRA A. HUNT JR.

Deputy Chief of Staff for Individual Training

US Continental Army Command

CONTENTS

Volume IV-Training Quality Control Workshop

1/ Papers were not presented. Authors, with the exception of Mr. Gerber,
   served as members of the pannel discussion on "Evaluation Leadership
   and Communicative Skills."

2/ MAJ H. L. Shortnacy, USAIS, served as a panel discussant and submitted
   Mr. Gerber's paper as reflecting his views.

WORKSHOP SCHEDULE

for

TRAINING QUALITY CONTROL WORKSHOP

<u>13 December 1972</u>

Room 162

Chairman: MAJ R. F. Malone   Consultant: Dr. T. O. Jacobs
          USAAGS   HumRRO

Time

0800–0905	1300–1305	Introduction	MAJ R. F. Malone USAAGS
0805–0820	1305–1320	Status of DA Military Occupational Data Bank	Mr. M. Berger DA DO-PM
0820–0835	1320–1335	Post Grad Questionnaire	Dr. V. P. Cieri USASCS
0835–0845	1335–1345	Discussion of Above	MAJ R. F. Malone USAAGS
0845–0915	1345–1415	User Reaction (Panel of Students)	MAJ R. F. Malone USAAGS
0915–0925	1415–1425	Discussion of Above	
0925–0935	1425–1435	Break	
0935–1055	1435–1555	Evaluation of Leader- ship & Communicative Skills Panel	LTC W. R. Munn USAES Chaplain, LTC Snyder USACHS MAJ H. L. Shortnacy USAIS MAJ P. H. Gorman USATSCH Dr. T. O. Jacobs HumRRO Mr. J. L. Sherrill
1055–1115	1555–1615	Discussion of Above	Mr. J. L. Sherrill USAAGS
1115–1130	1615–1630	Consultant's Obser- vations	Dr. T. O. Jacobs HumRRO

TRAINING QUALITY CONTROL WORKSHOP

WORKSHOP COMMITTEE & BIOGRAPHICAL SKETCHES

WORKSHOP COMMITTEE

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Chief, Training Quality Control Branch
Cirruculum & Evaluation Division, DOI
US Army Adjutant General School

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Chief, Command & Leadership .
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Educational Advisor
US Army Adjutant General School
Ft Benjamin Harrison, IN

BIOGRAPHICAL SKETCHES

MAJ Richard F. Malone

MAJ Malone is currently Chief of the Training Quality Control Branch, Curriculum and Evaluation Division, Office of the Director of Instruction, US Army Adjutant General School. A graduate of Texas Tech Unniversity (B.A. Speech 1963, M.Ed, 1971). MAJ Malone has served in a variety of assignments ranging from Battalion Adjutant in Europe to Systems Engineering Officer at USAAGS. MAJ Malone has attended the Automatic Data Processing Systems Analysis Course and the AG Officer Advanced Course and is a member of Phi Kappa Phi and the Academy of Management.

Dr. T. O. Jacobs

Dr. Jacobs received the Ph. D. degree from the university of Pittsburgh in 1956. Since joining the Human Resources Research Organization, he has specialized in leadership research and leadership training development. As Director of HumRRO Division No. 4, he is presently responsible for direction of its research program in motivation, leadership and both group and individual effectiveness. He is a Fellow of the American Psychological Association and the Georgia Psychological Association. He holds membership in the Southern Society of Philosophy and Psychology, Psychometric Society, and National Council on Measurement in Education.

Mr. B. Michael Berger

Mr. Berger is currently Technical Advisor and Data Systems Coordinator of the U. S. Army Military Occupational Data Bank (MODB). A graduate of Syracuse University (B. A. Psychology, 1960), Mr. Berger served as a case-worker with the Onondaga County Department of Social Welfare after one year at the Syracuse University School of Social Work. Entering active duty in 1962, he was assigned as Personnel Psychologist and then Recruiting Officer at the Albany, New York Recruiting Main Station. Transferring to Military Intelligence in 1964, he served as a unit commander in Korea and then as Chief of Personnel Security Investigations at an M. I. Group in Washington, D. C., having been school trained as an Intelligence Research Officer and Area Intelligence Officer. Mr. Berger came to the Office of Personnel Operations as a civilian in 1968 and was assigned as Chief, Selection and Classification Tests Section in Personnel Management Development Office. He moved to Military Occupational Specialty Branch as a management analyst, and in mid 1972 assumed his current position. As a reserve Officer, Mr. Berger has served on the faculty of the First U. S. Army Area Intelligence School, Fort Meade, Maryland. He is currently a unit commander and serves as senior Army information officer for the District of Columbia Army National Guard.

Dr. Vincent P. Cieri

Dr. Cieri is currently Educational Advisor of the US Army Signal Center and School, Fort Monmouth, New Jersey. A graduate of Columbia University (Ed.D. 1955), Dr. Cieri formerly served as Director of Research and Measurement for the Union City, New Jersey, Public Schools; as Director of the Proficiency Test and Analysis Agency and the Chief of the Evaluation and Educational Research Division at the Signal School; and, as Technical Director of the Computer Assisted Instruction Project at Fort Monmouth. He also recently served as Interim Product Manager for the Computerized Training System Project at the Signal School for the US Continental Army Command. He is a member of several professional organizations including the American Educational Research Association. He is also a member of the Graduate Faculty of the Department of Teacher Education at Monmouth College.

LTC William R. Munn

LTC Munn is currently Special Assistant to the Assistant Commandant, US Army Engineer School, Fort Belvoir, Virginia. A graduate of Ohio State University, LTC Munn has served in a variety of school, staff and command assignments. School assignments include a prior tour at the Engineer School, Fort Belvoir and the US Army Engineer School Europe. Recent assignments include duty with the Office, Chief of Engineers, Department of the Army and Commander 39th Engineer Combat Battalion Vietnam. LTC Munn has attended the Engineer Officers Advanced Course, US Army Engineer School, Fort Belvoir, Virginia and the Armed Forces Staff College, Norfolk, Virginia.

Chaplain (LTC) John S. Snyder

Chaplain Snyder is Chief, Evaluation and Methods at the US Army Chaplain School, Fort Hamilton, New York. A graduate of Princeton Theological Seminary (BD 1957, ThM 1965), Chaplain Snyder is currently studying at New York Theological Seminary and Rutgers University. He is a member of the American Personnel and Guidance Association. Entering the Army in 1957, Chaplain Snyder's assignments have included Fort Knox, Okinawa, Fort Monmouth, Berlin, and Vietnam.

MAJ Harold L. Shortnacy

MAJ Shortnacy is currently Chief, Evaluation Division, Office of the Director of Instruction, the US Army Infantry School, Fort Benning, Georgia. A graduate of the University of Nebraska at Omaha (BGS, 1969), MAJ Shortnacy was a graduate student at Kansas State University concurrently while completing the US Army Command and General Staff College Course at Fort Leavenworth, Kansas (1971). His military experience includes the normal command and staff assignments in military units and two tours as a member of the staff of the Infantry School. During his second tour in Vietnam (1969-1970), he served as Chief, Plans Branch, Training Center Division, Training Directorate. In that capacity he directed the efforts of a study group formed to determine training requirements, funds, and facilities required to train the Viethamese Armed Forces during a 5-year period for submission to the Joint Chiefs of Staff.

MAJ Patrick H. Gorman

MAJ Forman is currently Chief, Command and Leadership Branch at the US Army Transportation School, Fort Eustis, Virginia, a position he has occupied since July; 1972. A 1959 graduate of Rutgers University, where he majored in Political Science, MAJ Gorman has served in varied command and staff positions in CONUS and overseas since entry on active duty. Military schooling includes Infantry Officer Basic Course, Basic Airborne Course, Transportation Officers Advanced Course, US Army Command and General Staff College, and the Defense Languate Institute (LOATIAN). MAJ Gorman also attended a 3-month course in Creative Leadership at the Center for Creative Leadership Greensboro, N.C. (Sep - Dec 71).

Mr. James L. Sherrill

Mr. Sherrill received the BA (1952) and MA (1955) degrees from George Peabody College, and recently (1971) completed a year of graduate study in Instructional Systems Technology at Indiana University. After three years of High School Teaching, Mr. Sherrill joined the US Army Aviation School as an instructor in the Instructional Methods Division in 1953. In 1960 he transferred to HQ USCONARC, Office of the Deputy Chief of Staff for Individual Training as a Staff Training Specialist and in 1963 he transferred to the US Army Adjutant General School in his present position as Special Assistant to the Commandant and Educational Advisor.

TRAINING QUALITY CONTROL WORKSHOP

ABSTRACTS OF PRESENTATIONS AND

SUMMARIES OF DISCUSSION

1. External Training Quality Control

    a. Abstract of "The Military Occupational Data Bank." Current developments within the MODB, availability of data to various users, and usefulness of MODB information at the service schools for systems engineering and as a supplement or replacement for the Post-Graduate Questionnaire Program. Discussion of the addition of data analysis to the MODB operation, conversion of the measurement scale from frequency to relative time spent, and some of the findings resulting from data analysis. Impact on POI and Post Graduate Questionnaire Programs was also discussed.

    b. Abstract of "Job Evaluation Questionnaire Program at the US Army Signal Center and School." Topics discussed included: rationale for the program, control conditions, and some of the mechanics and findings of the program. A short TV presentation used to orient students was shown.

    c. Discussion following the presentations centered on:

    (1) The value of task frequency information vs relative-time spent information.

    (2) The validity of the MODB information.

    (3) Impact on field of various surveys: MODB surveys, school-conducted post graduate questionnaires, and other one-time mailed surveys.

    (4) Possible duplication of effort between the MODB and post graduate questionnaires.

    d. No conclusions or recommendations resulted. Strong differences of opinion were evident.

2. Student Course Critique Panel.

    a. The use of a student course critique panel was demonstrated using advanced officer course students furnished by the Air Defense School.

    b. In the discussion following, several School representatives reported they were using various versions of the techniques and consensus was reached that:

(1) The technique offered an advantage over the more typical end-of-course written comments; namely, the opportunity to follow-up in-depth student comments.

(2) The technique was a worthwhile supplement to other student course critique means.

(3) The criticisms offered were quite similar to those offered by advanced course students in other service schools.

3. Evaluation of Leadership and Communicative Skills.

a. A panel composed of representatives-of five Army Service Schools and one outside training consultant discussed the evaluation of leadership and communicative skills. Each participant submitted a paper which was not delivered during the workshop but which were made part of the record of the workshop proceedings. Abstracts follow of each of these position papers, which reflected the personal views of only the author.

(1) LTC Munn, USAES. Useful evaluation of leadership skills can and must be accomplished particularly in basic professional courses. A new leadership evaluation system currently being implemented at the USAES, was described.

(2) Chaplain, (LTC) Snyder, USACHS. A description was given of the recently introduced evaluation system at the US Army Chaplain School to measure personality strengths and weaknesses. Major principles are the use of descriptive, non-normative ratings by peers and the systematic determination for specific jobs of appropriate affective skills.

(3) MAJ Shortnacy, USAIS. At USAIS, considerable progress has been made in the objective evaluation of soft skills. However, certain aspects, especially in the leadership area, continue to present a challenge.

(4) MAJ Gorman, USATSCH. A movement away from a "trait-characteristics of leadership" and towards a behavioral approach to leadership training in Army Service Schools is evident. However, a serious examination of how to evaluate leadership training has not been attempted.

(5) Dr. Jacobs, HumRRO. The paper discussed problems in the development of leadership evaluation methods, within the context of soft skills systems engineering itself. Problems include the difficulty of finding a "true expert," the general lack of clarity concerning ultimate criterion measures, and the fact that leadership skills are essentially disjunctive (as most other soft skills probably are). The paper agrees with Whitmore as to the value of the behavioral scientist, in soft skills systems engineering, but also cautions against (a) theoretical biases that may lead to misdirected work, and (b) misconceptions due to lack of experience as a line executive. Either may be counterproductive.

(6) Mr. Sherrill, USAAGS. A review of selected literature suggests that present Army Service School evaluation practices in leadership and communication skill training areas do not possess sufficient objectivity and are not predictive of relevant criteria. The suggestion is made that improvements may be possible through an "operationalizing" approach.

THE MILITARY OCCUPATIONAL DATA BANK (MODB)

MR. B. MICHAEL BERGER

The year 1972 presented a significant challenge to the U. S. Army Military Occupational Data Bank. Faced with a lack of acceptance and use of MODB output, both at the service school level and within the DA staff, the MODB initiated a massive reorientation of its operation to establish itself as a useful and viable management tool. Early in 1972 it seemed that a proposed system (MODB II) would provide the users with just such a tool. MODB II had been discussed at a series of user conferences and had gained significant acceptance. Within the first quarter of the calendar year, however, Department of the Army was apprised of a joint occupational analysis system which seemed headed for adoption by all the services. The joint system, basically a comprehensive series of report production programs, did not have the capacity to handle MODB variety and production requirements, nor did it contain a system for questionnaire development or field data collection. Analysis did, however, reveal that the joint system could, when added to improved and modified MODB programs, provide an expanded occupational data analysis capability for the Army. By mid-1972 it had been decided that the Army would abandon MODB II development and concentrate the data bank effort toward incorporating the new methodology into the MODB system.

Development of the new system required a substantial reorganization of data collection and interpretation methodology. An entirely new questionnaire was required in order that the Army system be compatible with the input requirements of the joint computer facility. The new questionnaire, incorporating the best features of MODB I, many of the proposed features of MODB II, and concepts gleaned from Air Force and Navy occupational questionnaires, was prepared. Although similar in style to current MODB Questionnaires, the redesigned instrument contains certain new features worthy of mention. The Background Section has been greatly expanded to capture more information about the MOS incumbent completing the questionnaire. The additional data will enhance the usefulness of the occupational information by permitting greater variety in selecting data samples. Negative (or "NO") responses have been dropped from the Task and the Equipment Sections. Incumbents will respond to and rate only those items they actually perform, use, or maintain. The most significant change, however, is in the task rating scale. Research conducted by our sister services clearly indicated that "time" rather than "frequency" was a more valid measure of task performance. Whereas previous Army questionnaires have measured tasks in terms of frequency of performance, the new questionnaire will use a rating scale based upon relative time spent performing a task in relation to all other tasks performed. Air Force and Navy experience indicates that a "time spent" scale will be of far greater significance in analyzing tasks and developing programs of instruction, and will be of greater value in conducting interaction between occupational data and the wide variety of management systems upon which such data impacts.

The new system stimulated immediate establishment of an in-house data
analysis capability. As a part of the expansion and reorganization of
the data bank a separate Data Analysis element has been created. This
element is presently operational under the current MODB system producing
output in the form of analytical reports for use by the service schools
and DA staff elements.

To understand what the MODB can do for the user, the user must understand
just what the Data Analysis does. Data analysis is nothing more than the
application of a concentrated analytic effort to MODB output to determine
the impact of occupational data upon the various management systems of
the Army. These management systems include doctrine, budget, force
structure, selection and classification, training, and assignment and
utilization, and can further extend to the research and development effort
by supporting studies conducted by agencies such as HUMRRO, USACATB, and
BESRL. In one form or another, MODB output has had some impact on each
of these systems.

Basic data analysis begins with a review and consolidation of the hand
written comments included by MOS incumbents on the questionnaire Job
Evaluation Page. These comments, which have included remarks by as many
as 75% of incumbents responding to a single questionnaire, are reviewed
for clues to significant problem areas and other "keys" to evaluation
of the computerized data. A rough report is prepared from these comments
to be included later with the tabulated data or sent under separate cover
to the users. The computerized questionnaire data is studied to determine
trends, problem areas, and other items of significance which might denote
potential deficiencies in any of the systems mentioned. An analytical
report is prepared for written or oral presentation to the various users.
Presentations have been made to users such as Army service school staff
members, the Enlisted Personnel Directorate, and DCSPER DA special staff
elements such as the Office of the Provost Marshall General.

During the analytical process, the MODB staff takes full advantage of
all available information sources such as the Enlisted Master Tape File,
the Army Materiel Plan, POI files, and force structure reports to insure
that within the limits of its capability its recommendations are complete
and timely. Analytical depth is limited only by practical constraints
imposed by personnel limitations and scheduling requirements which force
a heavy workload on the organization. As a result, the MODB relies
heavily upon the various users to persue furnished "clues" to their
logical conclusion. In each case the final outcome of the analytic effort
depends heavily upon action by the recipient of the MODB report. Although
the MODB is constantly available to assist in interpretation and analysis
of its data, and encourages management actions to correct deficiencies and
improve the various systems, the organization itself is not empowered to
direct accomplishment of tasks regardless of their validity.

In this regard, results have been most gratifying. In the recent past, users have applied the one aspect that cannot be conveyed through MODB reports - JUDGEMENT - and recognized the significance of numerous findings through initiation of major changes and revisions to existing policies and structures. The MODB recognizes that this same aspect of judgement may also determine that MODB findings are not valid, and in fact incorrectly reflect a specific situation in the field, however, it is felt to be in the best interest of the Soldier, and certainly the Army as a whole, to surface any and all clues or other indicators as they are discovered through analysis.

It is clear that the MODB contribution to its users is well worth the possibility of occassional misinterpretation which can and will occur through the analysis of data collected from the field.

JOB EVALUATION QUESTIONNAIRE PROGRAM
AT THE
US ARMY SIGNAL CENTER AND SCHOOL

Dr. Vincent P. Cieri

Feedback has long been recognized as an integral and essential part of the training process. Properly defined, it represents the return to a control center of the information regarding events under its control. Other psychologists define it as the process of sensing and correcting. Prominent educational psychologists have conducted studies in the feedback process which show it to be the strongest, most important variable controlling performance and learning and that it is most effective when it is frequent, precise, and prompt.

With these facts in mind, the US Army Signal Center and School has placed a great deal of emphasis on conducting an extensive and effective post-graduate questionnaire program in order to accomplish the quality control aspect of the systems engineering process. The program is conducted within the framework of guidance provided by CON Reg 351-3 entitled "Education and Training Administration and Training Policies" dated 1 July 1972.

The basic objective of our program is to provide feedback from the field that can be used to evaluate the effectiveness of school courses in training personnel to perform the duties of their MOS's. This evaluation includes the adequacy of course content, the appropriateness of training emphasis, and the proficiency of course graduates as demonstrated after a period of job experience. The information is utilized not only to furnish the command with data about the overall adequacy of school training, but for use in a very practical way by curriculum specialists for updating programs of instruction and for correcting training deficiencies.

Our program has been conducted for more than 15 years, but the techniques employed in the earlier years did not yield useful results primarily because of sparse returns. Recent modifications in procedure have increased the efficiency of the program to a point where we are currently receiving, for some courses, as high as 70% return from the field. Improved methods and a high degree of command emphasis are the major factors contributing to the current success of the program.

The basic data gathering elements in the program are a pair of questionnaires for each officer and enlisted course--one for the graduate and one for his immediate supervisor. Special attention has been given to making these instruments attractive as well as complete and at the same time, easy to fill out. They are printed to insure attractiveness and can be answered simply by checking a blank or circling a number. All items in both questionnaires are coded and the data is punched into cards for analysis by ADP equipment.

The graduate's questionnaire is designed to yield a comprehensive description of the technical job behavior of the graduate after he has had 3-5 months experience in the specialty for which he was trained. The questionnaire content is job oriented. Detailed information is requested regarding the job tasks performed, the frequency of performance of these tasks, and whether the jobs are difficult. The same information is requested for equipment used or maintained, and regarding techniques or procedures employed in performing these tasks. Space is provided for the respondent to list equipment or tasks not covered by the printed questionnaire. Supplementary information useful for evaluating job performance is also requested and includes the graduate's primary MOS, duty MOS, level of maintenance performed and type of unit to which assigned.

The supervisor's questionnaire includes questions about the graduate's duty assignment, on-the-job training, as well as a rating of the graduate's job proficiency in major task areas. For this latter purpose, an eight-point scale furnishing a

measure of job proficiency in each task and skill or knowledge area as well as an overall rating is used. Copies of these questionnaires are available to you if you wish to examine them in detail.

These questionnaires are forwarded to the graduate and to the supervisor 3-5 months after the student has graduated. The materials, with a letter of transmittal from the school's Commander, are sent to the commander of the unit to which the graduate is assigned. Self-addressed return envelopes are furnished to facilitate the return of the questionnaire by the graduate and his supervisor independently.

Several direct actions are taken to encourage the graduate to return his completed questionnaire. One of these is a brief television presentation which is presented to the students two days prior to graduation. Additionally, during the graduation ceremony, members of the graduating class are again reminded that a questionnaire will be sent to them and a personal appeal is made for their cooperation in the feedback process.

A critical requirement for valid findings is that the graduates, whose questionnaires are included in the sample for analysis, are representative of the population of recent graduates with duty assignments in a particular MOS. Further, the duty assignments of these graduates must be representative of the varied types of units and geographical areas to which graduates are assigned. One hundred percent sampling of graduates, coupled with the aggressive program to maximize return of the completed questionnaires, furnishes reasonable assurance that the first part of this requirement is satisfied. Normal replacement of personnel over a period of time can be expected to yield returns from all types of units and geographical areas, but the representative nature of the returns should be verified during the analysis process.

Sample size is a consideration in any survey. Other considerations aside, the larger the sample, the more reliable the results. About one hundred is the minimum number of questionnaires considered for analysis in most instances while up to

five hundred or more may be desirable for detailed analysis of sub-samples to include such areas as type of unit, type of job activity and equipment used.

A practical limitation to sample size is the output of the course. If the output is small, the number of graduates may not reach 100 even over an extended period of time. However, if a high percentage of returns can be obtained, so that the sample of analysis includes essentially all graduates during the time frame in question, at least the findings will be based on the best available sample.

Additionally, we must face the fact that many of the returns will show that some graduates are assigned to duties outside of the specialty for which they have been trained. Thus, the sample may be reduced in some instances to 40-50 percent of the questionnaires originally mailed. In these cases, we have concluded that it is best to analyze the usable returns since findings of a survey based on a relative small number of graduates may be better than no information at all under some circumstances.

In USASCS courses having large inputs, 100 percent sampling may yield the required number of returns within a year. A time limit of approximately two years is established even for low density courses to insure that the information is reasonably current. If the questionnaires are accumulated over an excessively long period, the gain in reliability may be offset by loss in validity resulting from changes in the job situation during that period.

When a sufficient number of questionnaires is accumulated for analysis, they are screened to insure that each one is complete and free of discrepancies that might invalidate the findings. The principal requirements for inclusion of a questionnaire in the sample for the primary analysis are: First, the duty MOS of the graduate must be the one for which he was trained, and second, the period of his duty assignment must be

at least two months but not more than nine months.

Data are punched into cards for processing by ADP equipment.
In the analytical process for the graduate's questionnaire, a simple
frequency count is made of the response to each item.   These
frequencies are converted to percentages of the relevant base number.
Student comments are also reviewed for additional information.   A
similar procedure is used for the supervisor's questionnaire except
for the ratings of job proficiency.   In this area, a simple frequency
count is made for the ratings in each task area, the frequencies
being converted to percentages to permit comparison of the distribution
for task areas.   Mean ratings are also computed for each task area
to permit comparison of areas.   A weighted composite rating is then
computed for each graduate and a frequency distribution made of these
overall proficiency ratings.

The scope of the information derived about job activity of
graduates is suggested by the following list of topics in one survey:

    a.   Duty assignments
    b.   Length of time in job since graduation
    c.   Level of maintenance at which graduate worked
    d.   Major equipments maintained
    e.   Troubleshooting aids used
    f.   Job tasks performed (including frequency of performance,
and whether the tasks were easy or difficult at the time of the report)
    g.   Job tasks performed and equipments worked on that are
external to MOS for which trained
    h.   Job proficiency of graduates

From this detailed information, it is possible to develop a com-
prehensive analysis of the job activity of course graduates after
they have been on the job for a substantial period of time.   Com-
parison of the graduate's job activities and equipment worked on
with the program of instruction furnishes a basis for evaluating
adequacy of course content.   The proportion of graduates who main-
tain given equipments or perform other tasks, the frequency of
performance and the difficulty encountered in performing them,
together with added comments by both graduates and supervisors

furnish many insights into the relation between school training and job performance and requirements.

The analysis may bring to light training deficiencies that require corrective action by the course. Occasionally, evidence is found of greater emphasis in the course in a given subject matter area than is required by the job situation. Findings have also at times revealed the prevalence of new equipment in the field not previously covered in the course or the fact that equipment no longer common in the field is still included in the course. Other findings have at times referred to the need for strengthening techniques and procedures such as troubleshooting, requiring a change in instructional emphasis in related course areas.

The conclusion that is common to all surveys made to date, however, is the general excellence of the training in the USASCS specialist and officer courses since analyses have consistently shown that graduates can perform their technical duties at an acceptable level of competence after a period of on-the-job training. Further, they have been able to adapt their school training to a wide range of unfamiliar equipment.

A comprehensive written report of the findings of each questionnaire survey is prepared and includes a narrative portion which summarizes the evaluation of the effectiveness of training in the course. Detailed tabular data are also furnished for use by curriculum specialists and course per-sonnel who may require more specific information. The written report is furnished to the appropriate department director for review and comment to include an indication in these comments of the action taken on each conclusion reported in the survey. These comments are then incorporated in the published report which is then disseminated to the appropriate command and staff elements in the school.

In addition to comprehensive reports, informal surveys
a e made from time to time on request from the instructional
departments for information about specific equipment or about
job performance in selected areas. Completed questionnaires
on hand at the time of the request are used for these surveys.
At times, an informal report is prepared or on other occasions,
course personnel may simply inspect the questionnaire file for
data to provide the information for a specific problem. Another
report, called a Fast Feedback Report, can be requested. This
includes a computer print-out of all the graduate and supervisor
data available in raw form. These data can be used for fast
examination and analysis by course personnel.

The graduate questionnaire program which I have briefly
described has played a large part in the development, revision
and reorganization of courses of instruction at the USASCS,
furnishing objective information to support decision making.
The key ingredients in this successful effort have been, in my
opinion, the strong Command support given to the program, the
highly professional aspects of the development of the program
instruments as well as the ease of administration for the
graduates, their supervisors, and for school staff personnel.

These elements have given the USASCS a feedback program
which has not only been looked to for guidance by the staff of the
school but has been supported and sought after by the faculty in
the pursuit of a most effective and viable training program for
the school.

TRAINING QUALITY CONTROL

USER REACTION

MAJ Richard F. Malone

US Army Adjutant General School

All of our Service Schools ask our students to evaluate the training they received. For the most part we solicit students comments in writing. The styles we use range all the way from quite elaborate ADP summarized Questionnaires with rating scales to very unstructured and open ended student comment sheets containing simple directions: e.g., "Submit any comments you believe appropriate."

One posisble, and little used, means of obtaining our students' evaluation of their training is to form, from a random selection of a class, a panel of five or six students. Possibly the one major advantage of the "written comments" approach offered by the panel is the opportunity to follow up in depth certain student comments. A second possible advantage: some student concern may be of such a nature that the student may be reluctant to commit them to writing and may be more likely to submit them orally.

We will shortly demonstrate the use of this approach. Before we do, a few observations are appropriate.

We suggest that only one representative of the staff and faculty be present and that he:

    a. Serve as the panel chairman
    b. Be a member of the DOI rather than one of the instructional depts.
    c. Have rank comparable with students comprising the panel
    d. Play the role of a neutral observer interested only in obtaining, as nearly as is possible, the real concerns of the students

A couple of administrative observations about the demonstration.

    a. Our thanks to the US Army Air Defense School for allowing us to use their students
    b. Please treat the substance of the students' comments as privilege information: not to leave the room
    c. We should focus our attention on the method: is it worthwhile; should we use the approach to replace or supplement our more usual procedures?

The students serving on this panel received yesterday a DF containing information about their selection and the purpose of the panel. A copy of these instructions are at Inclosure one.

AT....   Course Critique _ _ _ _ _

TO: Date:_ _ _ _ _ _ _ _ _
                                               MAJ Malone7

1. You and four others have been selected to represent your class in a panel
discussion formed to critique your course. Please be present in room ____ at
____ on ____ ____ ____.

2. You are asked to be prepared to discuss and evaluate any part of your course
you believe needs improvement as well as those parts which should remain unchanged.
Do not limit your discussion, necessarilly, to the academic side of your training.
Instead, examine any areas, favorable or unfavorable, which had the greatest im-
pact on the students in your class. Below are listed possible areas (as well as
others of your choice) you may wish to discuss. You may wish to use the reverse
side to write some of your preparatory notes.

                                        _ _ _ _ _ _ _ _ _

                                        _ _ _ _ _ _ _ _ _
                                        Director of Instruction

            Administration   Materials

                Inprocessing   Reference materials
                Outprocessing   Reading assignments
                Housing   Classrooms
                Pay   Equipment
                                                      Training Aids

            Course Content   Competency

                (Annexes in POI   How qualified do you
                 listed here)   feel to perform on the
                                                       job

            Instructors   Evaluation

                Subject knowledge   Tests
                Teaching techniques   Procedures
                Instructor/student interaction   Policy

Inclosure one to "User Reaction".

Training Quality Control

Evaluation of Leadership & Communicative Skills

* W.R. Munn, LTC
US Army Engineer School

Evaluation of leadership in an academic environment - can't be done, not valid, we don't even have a good definition of leadership - so go the remarks of many educators. I belong to the minority group that believe that leadership evaluation <u>can</u> be done. Admittedly, the answers we arrive at are not as precise as those in a mathematical equation but exceedingly better than none at all. In addition, it is my belief that CONARC Schools must evaluate leadership skills, particularly in our basic professional courses. Basic course students are, for the most part, untested leadership products and in the case of a few ROTC graduates, do not possess those leadership traits that are required in todays' professional Army.

The development and evaluation of leadership in EOBC students is of prime concern at the US Army Engineer School (USAES). The School is currently implementing a new leadership evaluation system for Engineer Officer Basic Course students. This system has been a joint project between the Army Research Institute for the Behavioral and Social Sciences (ARI) and the Engineer School. The evaluation is accomplished by a student leadership grade and development of an overall leadership profile of each student officer.

     a. Student leadership grades are established from engineer platoon leader performance type testing, physical fitness and peer and supervisor ratings.

     b. In conjunction with the student leadership grade, an overall leadership profile will be developed for each EOBC student. The development of this profile begins during the first week when each student officer will take the Officer Evaluation Battery (OEB). Battery results provide the Class Supervisor with information on leadership potential of individual students in the three areas of combat leadership, managerial-technical leadership and motivation and drive. Information will be utilized initially by the Class Supervisor in assignment of class leadership positions and student counseling. The OEB <u>will</u> <u>not</u> be utilized in the determination of the student leadership <u>grade</u> but does contribute to the establishment of the overall student leadership profile. The components identified and evaluated in the leadership profile are:

<u>Combat Leadership</u> - Defined as the abilities and knowledge necessary to lead men in combat and the ability to interact in a one to one situation with men and have them "follow" example and direction.

Managerial-Technical Leadership - The knowledge and abilities necessary to organize and coordinate personnel and materials into an efficient and effective structure.

Motivation and Drive - The willingness to exercise and utilize capabilities to their fullest.

Scholastic Engineering Potential - The ability to grow intellectually and progress educationally as an engineer to meet the requirements of the future.

Physical Fitness - The physical stamina required to perform in field situations.

Additional Leadership Experiences - Other experiences contributing to the overall leadership development of the student officer.

     c. While the above components are to some degree related to each other they are independent so that it is _not_ necessary that an officer high in one component be low in another. It is however, highly desirable that graduates rank high in all areas. The assessment procedures are divided into two broad categories, _measures of knowledge_, and _characteristics of performance_. (Incl 1) Knowledge tests will focus upon right/wrong indormation subject matter tests and right/wrong performance, hands-on tests. The evaluation of _Performance Characteristics_ will be made by the supervisor, instructor, associates, and the student himself and will focus upon the process of performing a task rather than the right/wrong aspects of the solution. The procedure used to select measures for each component was rational. The OEB scores were used as reference variables and other evaluative elements were selected which were correlated with the OEB and each other. The recommended weights assigned to each variable were based upon the known reliability and validity characteristics of the measures. The benefits of the program are that once strengths and weaknesses in leadership development and potential are identified, counseling and guidance can be given. This identification can help the School to plan more effective programs and make pregraduation decisions on the capabilities of individual officers. It also provides a longer range prediction of the student officer performance as a leader which will be coordinated closely with the Officer Personnel Directorate. In addition it aids the student officer to plan future study and development and to make more informed career choices. It is readily conceded that the USAES leadership evaluation system is far from perfect, however, I believe it represents a tremendous improvement over evaluative systems formerly utilized.

ASSESSING AFFECTIVE SKILLS: POSSIBILITIES AND PROBLEMS
Evaluation of Leadership and Communicative Skills
Ch (LTC) John S. Snyder
U.S. Army Chaplain School

Introduction

To engage in the assessment of leadership is to face the fact that while
we may often agree when an individual is an outstanding leader, it is more
difficult to reach a consensus on what factors are essential to leadership.
Personalities differ and styles vary among equally effective leaders. Fur-
thermore, some situations seem to call for a different sort of leadership
than other situations. A systematic measure of leadership, therefore, must
be inclusive and sophisticated enough to recognize the variations of effec-
tive leadership behavior, as well as the traits which are clearly the most
desirable in particular jobs or situations.

This problem has been acutely felt at the Chaplain School, charged as we
are to evaluate the students in the advanced chaplain course (C-22) for ca-
reer management purposes beyond a mere academic report. Academic achievement
alone never has been accepted as an adequate measure of a chaplain's perform-
ance, and faculty and peer ratings traditionally have been used to provide to
the Chaplain Branch management data on his leadership style and operating ef-
ficiency. While these kinds of ratings have never been popular and are sub-
ject to favoritism, guesswork, and generalities, the necessity to make some
kind of personality assessment has not been questioned. In fact, with the
current stress in the Chaplain School on task-oriented instruction, the neces-
sity for such an evaluation is more clear than ever. Not only is it necessary
for career planning purposes, but also it can assist in meeting a fairly re-
cently recognized need in the training of chaplains - learning and growing in
the affective domain. An individual's affective strength, or leadership
quotient, is a complex mixture of personality capacities and traits, and
should be measured by a systematic description of his separate behavioral com-
ponents.

Assessment of Affective Skills at the Chaplain School

Peer and faculty ratings of C-22 students were discontinued, not only be-
cause of the problems mentioned above, but because a method has been worked
out which offers a more objective and comprehensive measure of leadership and
work styles. It should be noted that the C-22 class is divided, for almost
all of the instruction, into 12-man groups, each with a faculty advisor. The
close association of these 13 men makes possible a fairly precise measure of

each member's behavioral style, as observed by the other members over several months' time. A rating sheet is made out by each man on all the members of the group, using the <u>Personality and Perception Inventory</u> (PAPI) originated by M.M. Kostick. While my purpose here is not to describe the PAPI in detail, I will say that each member uses the form to make a <u>descriptive</u> picture of each of the others. It is not a normative sorting. The average rating by the other members in the group constitutes each student's personality profile, which provides data for career management.

Because we wanted to make affective skills count toward the grade earned by the chaplain students, a method was devised to make the affective score count for 20% of the overall academic average. The plan works basically by establishing a list of ten major chaplain jobs, determining through experienced job holders and supervisors what sort of personality profiles best would satisfy the demands of the various jobs, determine the sequence of increased career significance in the jobs (i.e., more responsibility, higher rank), and then assign increasing weights to those positions. The students' affective scores are matched against the job profiles, with those matching the more heavily weighted jobs scoring higher.

Unsolved Problems

Our use of Kostick's PAPI is still in its beginning stage, and the success of this method of evaluating affective skills will only be known after several months, if then. Such instruments for measuring affective style are notoriously unreliable. Although the inventory has been used extensively in American industry, we wonder about the possibility that it will be transparent to some students. Moreover, any measure of affective skills in a C-22 course is handicapped by the fact that the environment is a school rather than the job. Whatever the students' job status or level of responsibility has been before coming to the school for the career course, they tend to revert in part to adolescent patterns of student behavior. How differently, we must ask, does a man operate in his present student group, compared to his behavior as a brigade chaplain or in some other responsible position? Finally, there is the problem of the validity of this sort of evaluation. Does a high affective score correlate positively with success in jobs with higher career significance? We don't know that yet, and obviously we can't until some sort of longitudinal study is made.

Conclusions

The problems in the precise and objective evaluation of affective skills are evident, but there are possibilities for effective measures, both for stimulating learning and for determining normative grading. The verdict is not yet in on the success of the experimental method in use at the Chaplain School. It is, however, a systematic attempt to evaluate leadership and other interpersonal skills as they pertain to the specific jobs for which the student is being prepared. By getting a descriptive profile from all the members of his instructional group, a group with which he has been intimately involved, we hope that we are getting as objective and accurate a picture of his behavior as is possible with today's methods. Regardless of the success or failure of the Chaplain School's use of the PAPI, however, two aspects of this approach should remain valid and be relevant to leadership assessment in other schools: the use of descriptive, non-normative ratings by peers and the systematic determination for specific jobs of appropriate affective skills.

TRAINING QUALITY CONTROL

Evaluation of Leadership and Communicative Skills

MAJ Patrick H. Gorman

US Army Transportation School

The recent wave of high level, comprehensive studies evaluating the
effectiveness of Army leadership has focussed unprecedented attention on
this complex interactive process.

As the mushrooming research of behavioral scientists finds increasing ac-
ceptance among top Department of the Army policy-makers, the philosophy
of military leadership instruction has also changed significantly to re-
flect, for one, the ascendance of the behavioral over the traitist
approach.

Throughout the Army Service School system leadership programs of instruc-
tion have undergone major revisions to deemphasize the traditional laundry
list concept embodied in earlier discourses on traits, principles and the
leadership concept, in favor of the behavioral approach which describes
the leadership process as a dynamic interaction deriving its impetus from
individual needs and motivations.

However, while the educational philosophy underlying leadership instruction
is changing little serious thought seems to have been given to redefining
instruction objectives and means of evaluation. We continue in the final
analysis to regard leadership as an irreducible totality regrettably beyond
the pale of effective measurement, except for a few related peripheral
skills. For example, two skills currently widely stressed are military
writing and oral briefings, which frequently serve as the basis for evaluating
an officer's communicative ability. In fact these one way communications
represent but a small part, related only in name to the wider, more demanding
sphere of interactive communications ("meanings are in people").

It's clear that we have thus far failed to come to grips with the funda-
mental question ultimately confronting all educators - what are we trying
to teach? What is it we want our students to learn? What is it we expect
them to be able to do? The issue of defining goals is complicated somewhat
by our inability to define our own operation lexicon. What is the functional
distinction between "leadership" and management"? Are they synonymous terms
for the same process, or do they describe separate sets of functions requir-
ing different skills?

Before we can establish realistic, attainable and measureable leadership
instructional goals, then, we must first determine specific student needs
based on an evaluation of field requirements, then identify those skills
the student must acquire to satisfy the needs. Although this is an over-
simplification, it does highlight what has, to date, been an area of weak-
ness. This approach will doubtless lead to many other fields of inquiry.
Are all leadership skills trainable in a school environment? If not, how
do we standardize instruction on those which are better left to practical
application in the field? .Is standardization of leadership instruction
necessary or desirable? Do the skills required by an Infantry leader
apply to the Quartermaster or Transportation leader?

This paper admittedly contains no answers, but addressing the questions
posed is in my judgment, an essential prerequisite to any serious attempt to
measure effectiveness of leadership instruction.

TRAINING QUALITY CONTROL WORKSHOP

EVALUATION OF LEADERSHIP AND COMMUNICATIVE SKILLS

By J. GERBER
Evaluation Division, DOI
Fort Benning, Georgia

Leadership and communicative skills are the Infantryman's stock in
trade - the peg upon which all his other skills and knowledge hang.
The evaluation of instruction in the leadership and communicative
skills is, therefore, very important to us at USAIS and occupies
a great deal of our attention.

For the sake of simplicity, the material that follows has been organized
along the lines suggested by the title of this panel, namely leadership
and communicative skills. By separating these two areas for treatment
in this paper, I do not intend to infer that they are considered
separately as a matter of routine. Actually, I feel that they should
be considered together in the normal course of events. That is to
say that in practice, the ability to communicate is an important
aspect of leadership and is normally one of the factors upon which an
assessment of leadership (or supervisory) ability is evaluated. For
ease of presentation, however, I have separated leadership and
communicative skills in this paper.

At the Infantry School, we provide instruction in both the explicit
and implicit aspects of leadership. In the explicit aspect, I am
referring to such things as factual information, principles, and
courses of action. In the implicit aspect, I am including attitudes,
morals, values, and beliefs. We feel that we can impart or teach the
explicit and _influence_ the implicit. Inclosure 1 shows a few of the
explicit topics, the ways these topics are presented, and the ways they
are evaluated. Inclosure 2 shows similar information on implicit
aspects of leadership.

As a general rule, we believe that instruction must be based on
specific, well-defined training objectives in order to achieve desired
results. Under this approach, precise instruction can be developed
and executed, and the results can be measured objectively. Where
succinct training objectives cannot be written, the instruction falls
into a gray area of definition, and results are difficult, if not
impossible, to measure objectively given the present state of the art.
The instruction may well be effective, but at the present time we
don't really know that it is or why.

Leadership in the aggregate we can recognize after the fact. We can observe and note of the man placed in the position of leadership that:

> He did say "Follow me!" and the others followed, or
>
> He did wave an arm toward the top of the hill and the others followed him.

The above examples are after-the-fact, go/no go, observable phenomena. We can infer that the leader perceived himself as a leader and that those who followed him perceived him as a leader. We aren't always able to determine precisely why this is true. With even less precision are we able to predict that this man will follow that man under any and all circumstances, as some newspaper stories coming out of Vietnam have been quick to point out.

Listing leadership qualities or characteristics in a task inventory is a very difficult undertaking. While we might agree that the "good" leader should be honest and fair, and should set the example for his followers, statements of these attributes are not readily convertible to training objectives. Using situational type instruction, we are able to evaluate behavior which we interpret as reflecting honesty and fairness, for example, but which may not in fact do so. In addition, we do not know to what extent stress will cause what we consider to be proper attitudes, beliefs, etc., to change. Here are some examples:

> The young platoon leader who leads the charge up a hill may not necessarily believe that the trip is necessary.
>
> The caucasian commander may demonstrate statistically a scrupulously fair promotion policy, yet hold a deep-seated contempt for non-white members of his command.
>
> The leader who is truly fair and honest may fail as a leader because he is not perceived as fair and honest by his subordinates. Asked for specifics, subordinates may not know or may not be willing to state that they are reacting to nonverbal cues such as the tilt of a head, the flicker of an eye, or the myriad other aspects of nonverbal communication with which the person in the leadership position is endowed or which he affects.

I am saying, then, that we may identify, teach toward, and evaluate affectively based behavior in the cognitive domain and delude ourselves into believing we have embraced the affective domain. My frame of reference here is Bloom's Taxonomy of Educational Objectives. I am saying that as a student enrolled in a leadership course, I can recite the School solution, apply the principles, demonstrate mastery, and reject the whole paradigm in so doing.

The task of USAIS, and indeed of all Service Schools, is to discover more effective means of evaluating the affective area - the gut feelings - resulting from the instruction we present in the so-called soft skills training. The alternative is to agree that we will expose the students to training or instruction that we hope will bring about or strengthen attitudes, beliefs, morals, etc. that we believe to be proper and leave the judgement as to how well we have succeeded to those who will observe and report on the performance of the students in future assignments.

At this time, USAIS uses some objective testing of knowledges and awareness (cognitive domain), but relies on subjective evaluation of the application of knowledge and awareness. Some of the subjective techniques used are:

    Instructor use of check list.

    Spot checks by "hard skills" instructors.

    Observations of tactical officers.

    Peer ratings.

    Counselling by successful leaders.

Instruction in overt communicative skills at the Infantry School falls into two categories: writing and speaking. We have limited writing and speaking requirements in certain of the basic level courses; however, the Infantry Officer Advanced Course contains a variety of communicative requirements. Inclosure 3 shows writing requirements and evaluation procedures; Inclosure 4 shows the same information on speaking requirements for that course. Although evaluation of these requirements is listed as subjective, some objectivity is introduced through the use of check-list type scoring for format, content, etc. We are placing increased emphasis on the communicative skills in the Advanced Course. The POI has been changed to reflect real-life requirements which the graduates will face in assignments subsequent to graduation. Using real life as a criterion, we have eliminated the requirement to write a monograph.

At present, we are studying the feasibility of allocating academic weight to communicative skills requirements to further upgrade this area of instruction. Our feeling is that the ability to speak and write well are indispensable tools of leadership, and the fact that they become increasingly important, in our view, as the leader progresses up the ladder has caused us to concentrate our emphasis on upgrading this area in the Advanced Course.

In summary, we at USAIS believe that progress is being made in the evaluation of soft skills, but there are some challenges in this area that we have not solved. Although we are pleased at the progress in this area, we will continue to apply diligent effort to the resolution of the portions that remain unsolved.

EXPLICIT LEADERSHIP TOPICS

SUBJECT	HOW TAUGHT	HOW EVALUATED
CONCEPTS OF MODERN ARMY LEADERSHIP	C; TV; PE	O
LEADERSHIP ASPECTS OF HUMAN BEHAVIOR	C; PE	B
SENIOR-SUBORDINATE RELATIONSHIPS	C; F; PE	J
THE EFFECTIVE LEADER	C	E
LEADERSHIP PROBLEMS OF COMMAND	C; PE	C
LEADERSHIP IN COMBAT	C; TV	T
PREVENTION OF AWOL	C; TV; PE	I
COUNSELING FOR SUBORDINATES	C; PE	V
LEADERSHIP ASPECTS OF CONTEMPORARY PROBLEMS--RACE RELATIONS; DRUG ABUSE	C; TV; PE; S	E
CONDUCT OF AN OFFICER	C; PE; TV	
LEADERSHIP PROBLEMS PANEL	S	

(HOW EVALUATED column reads diagonally: OBJECTIVE EXAMINATION)

SOURCE: Infantry Officer Candidate POI, 15 Nov 72

Incl 1 to
Evaluation of Leadership and communicative skills
by J. Gerber

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IMPLICIT LEADERSHIP TOPICS

SUBJECT	HOW TAUGHT	HOW EVALUATED
TOPICS FROM SLIDE 1	PE SIMULATION EXAMPLE	SUBJECTIVE
LEADERS REACTION COURSE	PE	SUBJECTIVE
LEADERS REACTION COURSE COUNSELING	C	SUBJECTIVE
DRILLS AND CEREMONIES	PE	SUBJECTIVE
TACTICAL PROBLEMS	PE	SUBJECTIVE

SOURCE: INFANTRY OFFICER CANDIDATE POI, 15 NOV 72

Incl 2 to
Evaluation of Leadership and Communicative Skills
by J. Gerber

SELECTED WRITING REQUIREMENTS

REQUIREMENT	HOW TAUGHT	HOW EVALUATED
MILITARY LETTER	HOMEWORK	
OFFICER EFFICIENCY REPORT	PE	
MSG FOR ELECTRICAL TRANSMISSION	PE	
SUMMARY SHEET	PE	S
COMMENT #2 TO DF	PE	U B J E C T I V E
FACT SHEETS (2)	PE; HW	
MEMORANDUM	PE	
BN CDR'S DECISION & CONCEPT	PE	
STAFF STUDY	HOMEWORK	

SOURCE: 1 NOVEMBER 1972 REVISED CONCEPT, INFANTRY OFFICER ADVANCED COURSE

Incl 3 to
Evaluation of Leadership and Communicative Skills
 by J. Gerber

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SELECTED SPEAKING REQUIREMENTS

REQUIREMENT	HOW TAUGHT	HOW EVALUATED
TECHNIQUES OF MILITARY BRIEFINGS	C; TV	SUBJECTIVE
PREPARATION OF MILITARY BRIEFING	PE	FACULTY ADVISORS ADVISE, COUNSEL, AND ASSIST STUDENTS IN ALL ACADEMIC AREAS.
PRESENTATION OF MILITARY BRIEFING	PE	

SOURCE: INFANTRY OFFICER ADVANCED POI, 21 NOV 72

Incl 4 to
Evaluation of Leadership and Communicative Skills
by J. Gerber

TRAINING QUALITY CONTROL

The Evaluation of Leadership Skills

T. O. Jacobs*

HumRRO Division No. 4

The primary purpose of this paper is to discuss, to some small extent,
problems involved in the evaluation of leadership skills. While the topic
of the panel as a whole concerns both leadership and communication, the
latter area is well addressed elsewhere. In addition, as will become evi-
dent, it will not be possible to discuss evaluation of leadership skills
without first discussing the current state of the art in their identifica-
tion and development.

SOFT SKILLS SYSTEMS ENGINEERING?

This frankly provocative title was selected to draw attention to the
probable source of current problems in quality control of soft skills
training. A basic problem, at least insofar as leadership is concerned,
is that the systems engineering of leadership training is only beginning
to emerge from the dark ages. As this paper will show, there is a substan-
tial lack of agreement on at least the following points:

    a. What leadership is.
    b. What affects leadership in organizations.
    c. The training experience that will produce improved leadership.
    d. Satisfactory measures of leadership ability.

Other participants in this conference, and in previous conferences, have
addressed themselves to the problems of soft skills systems engineering.
This paper consequently will not belabor the point -- and the difficulties
that have been encountered. A brief examination of two sources will serve
as an adequate review of the problem, to place the following discussion in
perspective.

Crawford (1966) has described seven steps in the development of training.
These steps are shown in Figure 1.

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*The views expressed in this paper are those of the author and do not
necessarily represent the official opinion or policy of the President,
Human Resources Research Organization or the Department of the Army.

Steps in the Development of Training

Analysis of the Military System from the Human Factors Point of View

Analysis of the Particular Job

Specification of Knowledges and Skills

Determination of Training Objectives

Construction of the
Training Program

· Programming of instruction
· Practice materials
· Achievement testing

Development of Measures
of Job Proficiency

Evaluation of the Training Program

Figure 1

IV-36
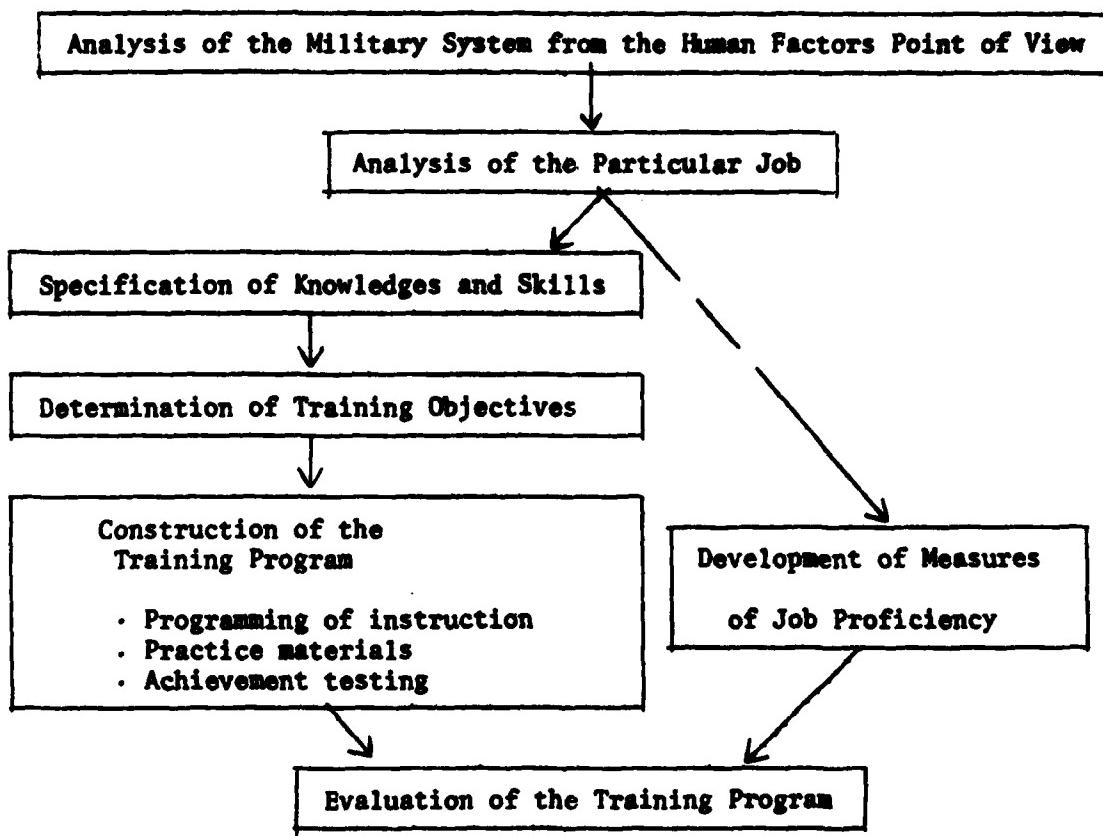
A case can be made that the major problem in soft skills systems engineering lies in the second step, analysis of the particular job. In his discussion of this step, Crawford says, "We are interested in the inputs to the job -- the kind of stimuli and requirements placed on the individual -- and the outputs from the job -- what the man does to bring about system output." This, of course, is a reasonable assertion. The problem arises when one attempts to implement this step. In fairness, Crawford's paper is not intended to be a "how-to-do-it." Nonetheless, it is instructive to note that a rough count shows that only 91 words were allocated to explication of this step. But, remember that Crawford's paper was not a "how-to-do-it" guide.

To a much greater extent, CONARC Regulation 350-100-1 was intended to be just that. Again, the purpose of this paper is not to malign the existing procedures. Nonetheless, examination of that section of the CONARC Regulation pertaining to development of the task inventory shows that only five pages of a total of 49 pertain to this crucial portion of the systems engineering effort.

Two observations can be made. First, this level of guidance probably indicates that the writers of this regulation did not anticipate that this step would be as much a problem in the soft skills area as has been the case. This observation is supported by reference to Paragraph A-2, which deals with job analysis information sources suggested as a basis for developing a task inventory. Of 15 possible sources mentioned in this paragraph, only one represents new information from job incumbents obtained specifically for the purpose of developing the task inventory.

A second observation, perhaps controversial, is that it appears to the present writer that both of the references discussed above implicitly assume that a "true expert" is to be found somewhere. The idea is that the "true expert," once located, will be able to specify his inputs and outputs. Finally, one might conclude that there may also be an assumption that there is one correct way to do the "soft skills" job. In the remainder of this paper, all of these possible assumptions will be questioned.

WHO IS THE TRUE EXPERT?

Without desiring to be critical of an interesting and innovative beginning, it is instructive to search momentarily for a true expert. Whitmore (1972), in discussing his concept of the job model, notes that "The identification and definition of job functions from system characteristics and the formulation of the behavioral processes underlying each function requires behavioral science expertise." This suggests the possibility that the behavioral scientist may be "the true expert," at least in this complex soft skill area. The validity of this assumption may be illustrated by a quick comparison of T-group protagonists and antagonists.

T-group (sensitivity) training is a fairly widely used form of training to which executives and leaders frequently are exposed in the belief that it will "develop" them. Bradford (1972), as one protagonist, describes how sensitivity training works. He concludes that, while not all individuals prc it equally from such training, most benefit to some extent and "... the majority of participants have learned and grown."

Adair (1968) criticizes sensitivity training on four counts:

a. Such groups have no formal tasks, which means that they do not have task and team maintenance responsibilities as real groups in formal organizations do. Thus, the experience is dissimilar to the on-the-job conditions of performance, which should decrease transfer of training.

b. Several assumptions underlying this approach probably are inaccurate. An example is the assumption that leadership functions should be distributed equally among the members of the group. Adair suggests the possibility that this may well not be true when there are real tasks which must be achieved under difficult situations.

c. This approach as a universal method of leadership training is culture-bound. (It should be noted that this criticism is not valid, if transfer of training is planned only to the culture to which it is "bound.")

d. There is a tendency for group psychotherapy to invade the training scene. With this invasion may come "preconceptions" which may not be appropriate for leaders of "normal" people.

The above attempt to pit two schools of thought against one another is, admittedly, somewhat unfair. Clearly, there would be points of agreement. However, the major point is that there clearly are differences in _objectives_, implied or explicit. That is, protagonists would identify one set of objectives for leader training and antagonists another set. The differences in objectives produce differences in the training approach taken. Further, the criteria which would be used to evaluate the effectiveness of the training would be quite substantially different.

Clearly, the "true expert" may or may not be the behavioral scientist. To the extent that he has theoretical biases, his degree of "expertness" may be compromised. And I believe that no one would assert that behavioral sciences are lacking in theoretical biases.

There is yet another reason why the behavioral scientist may not be the "true expert." Most behavioral scientists, as McGregor (1960), points out, have never been required to perform in the role of a line executive. McGregor, without such experience, had believed that a leader could operate essentially as an organizational advisor, and that good human relations would be quite effective in relieving discord and disagreement. Experience demonstrated to

him that a leader cannot avoid the exercise of authority. The leader cannot delegate the responsibility which he alone must assume for the workings of his organization.

This point has been made with trepidation, and with the anticipation of challenge. It is in fact correct that experience in the role is not necessary in order to be able to describe the role through rigorous observational techniques. So some behavioral scientists may be able to rise beyond inexperience to become "true experts." However, it is very difficult to observe intangibles. Leadership and executive skills are intangible. The necessary recourse, therefore, is to study experimentally the impact of variation in role behaviors on organizational outcomes. It should be recognized that this is an extremely difficult proposition. Several questions immediately are raised, which bear not only on systems engineering but also on evaluation:

    a. What should be used as the criterion? Should it be evaluations by superiors? Should it be evaluations by subordinates? Should it be some rating or objective measure of organizational performance?

    b. What organization can be made available for experimental study? Real organizations exist in a world that usually is competitive. Only rarely are real organizations available for experimental study. (And they also are hard to simulate.)

    c. How much time can be devoted to experimental study? The time required varies, depending on the object of the study. In a cross-sectional study, relatively little time is required. In a longitudinal study, months or perhaps even years may be required.

WHAT IS THE ACTUAL NATURE OF THE REAL WORLD?

Bruner (1956) discusses two different kinds of concepts. The first, conjunctive concepts, consists of those in which the logic is essentially transitive. That is, if in Middletown only residents can vote, it is possible to infer by knowing that an individual has voted that he is a resident. Man-machine systems basically are conjunctive systems. The logic of man-machine interaction is a transitive logic.

The second type of concept is disjunctive, in which this kind of transitivity does not occur. For example, if in Middletown either residents, taxpayers, or persons who work within the city may vote, then it is not possible to infer the individual's category from knowing that he votes. It is very likely that most man ascendant systems are characterized by disjunctive logic, where several different solutions may work in any given problem situation. (This is recognized in the idiom by the statement that any solution, well implemented, is better than no solution.)

Of course, it is possible that organizational leadership is not actually disjunctive. It may only appear so because of the many variables which may affect the impact of any given leadership behavior or approach. Further, there may be moderator variables which actually change the relationship between a given leadership behavior and the expected outcome. (Fiedler's contingency model illustrates the use of moderator variables in leadership theory building.) Several studies illustrate some of these variables.

a. Organizational Climate. In a relatively well-known study, Fleishman (1953) reported the effects of leadership training for foremen after the foreman had returned to their industrial situation. The leadership training itself consisted of a focus on initiating structure and showing consideration dimensions. Fleishman reported that the effects of the training appeared rather small when a later follow-up was made. The kind of supervisor (leadership climate) under which the foreman worked was more related to his own behavior than either training or lack of it. Foremen working under a considerate supervisor tended to express more considerate attitudes toward their workers, and received consideration scores from their workers which were higher.

b. Organizational Structure. Forehand and Gilmer (1964) further analyzed the effect of climate on leader behavior. They noted that organizational climate may be determined not only by the leadership pattern of one's own supervisors, but also by size, organizational structure, systems complexity, and goals. Presumably, any of these factors could negate or enhance the impact of leadership training, or modify the relationship between given leadership behavior and system outcomes.

c. Nonlinear Relationships. A report of a seminar held by the Foundation for Research on Human Behavior (1955) describes several of these nonlinear relationships:

(1) Production Pressure. When production pressure was low, an increase in pressure increased both satisfaction with supervisor and production, to a point, beyond which satisfaction dropped sharply.

(2) Group Cohesiveness. Group Cohesion is positively correlated with productivity when the company is perceived as supportive, but negatively correlated with productivity when the company is perceived as threatening. (This illustrates a moderator variable.)

(3) Closeness of Supervision. Production can be high either way, but morale suffers with excessively close supervision, and a large investment of supervisor energy must be expended also.

d. Subordinate Expectations. Jasinski (1959) reported an interesting study from the automobile industry, in which workers and foremen alike had proper and idealized descriptions of what the supervisor's role ought to be.

However, in actual practice the foreman's behavior was very different from the verbal description of the ideal role. Further, Jasinski found that workers really <u>expected</u> a different type of behavior from the foreman than they said they wanted, and the work environment precluded the lengthy interaction between workers and foremen that would have been required by "desired" behavior. Finally, the supervisors of the foremen gave little weight to foreman relations with men in their evaluations of the foremen.

When leadership is taught and evaluated in a service school, the service school essentially is serving a customer. The customer is the commander in the field who uses the product generated by the school. It clearly is important to develop and evaluate the right thing. One further example of the cataclysmic results that may occur when the wrong thing is developed is found in a report by Sikes (1962) of a course on human relations. This course was given to all managers and supervisors in a medium sized contracting firm. The evaluation tool was a questionnaire to supervisors. One question was, "Was the course as a whole a success or a failure"? The summary of answers was:

Success	0
Failure	83
No Opinion	14

These startling findings occurred because participants felt the course had not made any lasting improvement <u>in the attitudes of senior management</u>. However, the cataclysmic further result was a crisis in the conflict between expectations held by supervisors and by senior management concerning the role of management. This conflict led to resignations of 19 of the 97 supervisors who had attended the course. (In the two years preceding the course. only 2 had left.) Further, 25 more were known to have applied for other jobs.

HOW TO MEASURE THE UNMEASURABLE?

At the outset, it was noted that ultimate criteria are rarely available for measuring the impact of leadership training and development. There are probably two reasons. The first is the difficulty of obtaining objective criterion measures in real organizations. Realistically, this does present problems.

Another difficulty is that it sometimes is embarrassing to the researcher to be able to obtain such criteria, when they are available.

Korman (1966) distinguishes two kinds of validity, concurrent and predictive. Concurrent validity is derived from measurements taken at the same time that measurements are made of the so-called leader manipulation. Predictive validity is derived from a longitudinal study, in which a leadership manipulation is made, and efforts are then made to determine whether individuals in the experimental group behave in different (hopefully better) ways on the job.

The embarrassing part about such criteria is that they frequently lead
to the conclusion that no change has occurred, especially where the criteria
consist of objective measures of organizational performance. It will be
recalled that Fleishman's finding of no impact came from a longitudinal
study. In his own review of the literature, Korman found quite similar
results. His focus was on initiating structure and showing consideration
as leadership behavior variables. Most of the studies reported concurrent
validity, which Korman notes does not give good evidence of causality.
Further, the objective criteria, when they were used, yielded extremely low
correlations with either consideration or initiating structure. This is a
finding that is, of course, repeated fairly frequently in other studies.

Korman's other results are interesting in their own right. Table 1 on
the following page summarizes his review. It shows correlations between
initiating structure and showing consideration variables, and a variety of
other measures. In Table 1, concurrent and predictive validity data have
been mixed. As can be seen, there is substantial variability in the findings,
regardless of what criterion is used. The only consistent findings appear
to be correlations between subordinate ratings of leaders and showing con-
sideration behavior. Korman concludes that his survey of the literature
does not provide any reason for saying that these leader behavior variables
can predict work group performance, or under what conditions they might af-
fect work group perf rmance, a somewhat dismal picture.

These findings repres nt only a marginal sampling from the available liter-
ature. However, they do nonetheless illustrate the extreme difficulty of
determining what should be taught as leadership, how it should be taught,
and how the effectiveness of the resulting skill should be evaluated.

IF NOT ULTIMATE CRITERIA, THEN WHAT?

While so-called ultimate criteria may be available within organizational
settings, they generally are not available to the trainer. This has led
to a proliferation of intermediate criteria which have been used for assess-
ment purposes. Some of the vehicles for leadership assessment have been:

    Situational Performance Tests
    Situational Paper-and-Pencil Tests
    Personality Tests
    Peer Ratings
    Ratings by Seniors
    Leadership Grades

This list is by no means inclusive. It is intended primarily to illustrate
the diversity of approaches in current use.

Table 1

Correlations Between Various Criteria and
Initiating Structure and Showing Consideration

With	Initiating Structure		Showing Consideration	
	N	Range	N	Range
Objective Measures	5	-.05 to .23	5	-.11 to .14
Superior Ratings	8	-.39 to .13	8	-.06 to .29
Peer Ratings	8	-.11 to .14	8	-.17 to .03
Self Ratings	3	-.41 to .45	3	-.02 to -.46
Subordinate Ratings	3	.05 to .22	3	.24 to .51

Situational Tests. These tests generally depend for predictive validity on the similarity between the performance requirement (including group leader-ship and direction) of the test situation and that of the ultimate perform-ance situation. However, situational tests have been plagued by many common psychometric problems. Among these are the following:

. The difficulty of establishing parallel situations, so that different leaders will be assessed under comparable conditions of performance.

. The difficulty of establishing situations which in fact present real life performance requirements at other than a face valid level.

. The cost in terms of time and administrative difficulty in running good situational tests.

. The difficulty of training assessors so that they respond to the same leader behaviors in the same way, or even observe the same leader behavior variables.

. The difficulty of providing subordinates who respond as sub-ordinates would in real life. (In the test situation they hardly are subject to quite the same actual leader power as in a real unit.)

Situational Paper-and-Pencil Tests. An example is the In-Basket Test. A problem with this kind of test is that one of the most critical dimensions of leadership skill probably is interpersonal competence. The austere con-text of an In-Basket Test is hardly appropriate for assessing this kind of variable. Further, in the military setting, there may be some degree of stress associated with the performance requirement, which is difficult to simulate in an in-basket or other similar test. Finally, it is impossible to assess group maintenance or individual support leader behavior skills in a "solo" performance.

Personality Tests. Typical of this approach is the self-assessment test, which commonly takes the form of measuring the individual's proclivi-ties toward authoritarian, democratic, or laissez-faire leadership. The fallacies of this approach are obvious.

Peer Ratings. While it is difficult to know exactly what peer ratings measure, they generally have had better predictive validity than almost any other single approach. This may be because they probably measure the dimension of interpersonal competence and the ability to work within a co-ordinated group better than do most other approaches. However, even so, peer ratings rarely account for more than 25% of the total variance in subsequent leadership performance, and are always subject to the vagaries

of the peers who are completing them. That is, if a group decides to do so, "cooperate and graduate" can be made to work extremely well. Nonetheless, they are a "method of choice," especially when used in conjunction with other measures.

Ratings by Seniors. It is very difficult to assess the extent to which ratings by seniors are predictive in an independent sense. That is, in a formal school setting, peer ratings and tactical officer ratings are found to be fairly highly correlated. Ratings by tactical officers are generally less reliable than ratings by peers.

Leadership Grades. Finally, leadership grades have been developed from paper-and-pencil knowledge tests following leadership instruction. In unpublished research, HumRRO Division No. 4 has found them on occasion even to be negatively correlated with leadership grades obtained through a combination of peer ratings and tactical officer ratings. This suggests that they probably would not predict subsequent performance, in that peer ratings generally do.

A DISJUNCTIVE APPROACH FOR A DISJUNCTIVE CONCEPT

The picture to this point has been negative, and unfairly so. It was presented in this fashion to illustrate the difficulties in both soft skills systems engineering, and in the evaluation of soft skills. Soft skills systems engineering is extraordinarily difficult because of the absence of a "true expert," and because of the intangible nature of these skills. Because the evaluation process is necessarily dependent on identification of what is to be evaluated, the development of soft skill evaluation procedures has necessarily been impeded by the same problems.

However, it may be appropriate to make an assertion at this point. While it is extremely unlikely that any massive breakthrough is ever going to occur in soft skills systems engineering, approaches such as the behavioral model are conceptually sound, and will eventually produce a sound picture of what it is that needs to be trained. By the same token, it will then become feasible to develop evaluation techniques. The requirement is simply for patience and continued effort, with the realization that this is simply a much more difficult problem than hard skills systems engineering.

As an example of possible future evaluation approaches, it is appropriate to examine the "scientific assessment center." Management assessment centers are becoming more frequent in industry, probably because, as Byham (1972) asserts, they have shown themselves "...to be a more reliable indicator of future success than any other tool yet devised."

The assessment center works, probably, because it is so comprehensive in what it measures. (Critics might argue that if enough of an individual's behavior is observed, probably it would be possible to make predictions to _any_ future activity.) Byham identifies 25 "common dimensions" of managerial success. They are as follows:

1.	Impact	14.	Listening skill
2.	Energy	15.	Flexibility
3.	Oral communication skill	16.	Tenacity
4.	Oral presentation skill	17.	Risk taking
5.	Written communication skill	18.	Initiative
6.	Creativity	19.	Independence
7.	Range of interest	20.	Planning and Organizing
8.	Stress tolerance	21.	Management control
9.	Motivation	22.	Use of delegation
10.	Work standards	23.	Problem analysis
11.	Leadership	24.	Judgment
12.	Salesmanship	25.	Decisiveness
13.	Sensitivity		

Byham also identifies eight techniques which may be used in an assessment center for evaluating individuals on these dimensions. They are:

Interview
Management games
In-Basket and Interview
Leaderless Group Discussion (Assigned)
Leaderless Group Discussion (Non-Assigned)
Fact Finding and Decision Making
Analysis Presentation
Interview Simulation

Some of these may be better for assessing one or more of the preceding dimensions than others. In the assessment center, the optimum measurement approach is selected for each measurement to be obtained.

According to Byham, psychologists are considerably superior to untrained line assessors in the assessment center context. However, they are not always available, so companies tend to establish pools of trained assessors. With either, the predictive validity of the assessment center is quite good. Bray, Grant, and Campbell (1972) make an essentially similar point.

The difficulty with assessment centers is, of course, that they are expensive to operate, and have a low throughput of assessed potential leaders. Where management turnover is low, this is no problem, In the Army, with high input of junior leaders, it might be a problem.

However, in the context of the present paper, the assessment center concept is probably worth examining as the prototype for soft skills evaluation procedures development. The assessment center "covers the waterfront." Similarly, it is probable that the evaluation of any soft skill will necessarily cover a multitude of dimensions. Single unitary measures probably will not suffice. (This suggests that leadership training also will need to cover a variety of dimensions.) Finally, it is likely that leadership

evaluation procedures will gradually improve with experience and research, just as leadership development and training procedures improve through the same means. In each case, continued effort should provide increasingly improved payoffs.

As a final example of the inextricable intertwining of leadership research and leadership development, it is appropriate to examine a probable new direction in the assessment of organizational leadership. Students of small group theory will affirm that substantial progress in understanding of small group dynamics came only after researchers turned to the study of processes that occur in small groups. Examination of the assessment dimensions just cited shows that they are essentially person oriented. Thus, they are likely to be limited in their predictive power.

However, a few researchers have been turning to a study of organizational processes in order to understand organizational leadership more fully. This generally requires some sort of simulation of an organization, because real organizations cannot be "replayed." The capacity to repeat a standardized experience is, of course, necessary in order to develop a basis for inferential testing. As an example of this work, Olmstead (1972) has developed a simulation of a battalion engaged in a counterinsurgency operation. The simulation is designed to permit measurement of organizational process variables identified by Schein (1965) as the Adaptive Coping Cycle. These variables, and their correlations with independent measures of the adequacy of mission accomplishment, are:

Sensing a change in the internal or external environment	.92
Communicating the information to a decision maker	.83
Making a decision with the information	.70
Stabilizing internal changes	.11
Communicating change decisions	.71
Coping actions	.72
Obtaining feedback as to decision effectiveness	.03

It is beyond the scope of the present paper to present Olmstead's findings in greater depth. The significant point is that organizational leadership possibly should be viewed as the capacity to cause certain crucially important functions to be performed well. This would have equally significant implications for assessment of leadership. The question would be, "Leadership for what?" And the assessment technique would be examination of the leader's capacity for making processes work well.

As a contrast, Olmstead also obtained many of the conventional paper-and-pencil measures often used to assess leaders themselves, with miniscule results. In this simulation, the so-called "personality" measures used did not tap the capacity to make the process go smoothly. Also, they did not tap organizational effectiveness. The implications of these findings for assessment of leadership skills are profound.

SUMMARY

In this paper, it has been asserted that the development of leadership evaluation procedures has been impeded by the same obstacles that have slo..ed the development of soft skills systems engineering techniques. It is difficult to find a "true expert," and the incumbent is frequently unable to verbalize what he actually does because what he does is intangible. This requires that knowledge be developed through the arduous method of experimental study of leadership processes by researchers and other observers. However, the general unavailability of ultimate criteria of leadership effectiveness makes this a rather slower process than it otherwise might be.

The dearth of ultimate criteria has led to a proliferation of intermediate criteria. The researcher's own bias has often influenced the intermediate criteria he has chosen to study, and the hypotheses he has chosen to test. Researcher bias has also influenced the types of leadership processes he has chosen to study.

Despite the handicaps that shackle the researcher, among which is the fact that he rarely has been in the position of a line executive and thus does not know how it feels, the researcher probably is indispensible in the soft skills area as Whitmore has noted. This is not because of what he knows substantively. Indeed, he may be more dangerous because of his substantive knowledge. Rather, the researcher's value stems from his training in scientific methodology and from the fact that he is by virtue of that training a highly qualified observer. This assumes, of course, that his own theoretical biases do not blind him.

It is probable that most soft skill areas are disjunctive in nature. This creates substantial difficulties for anyone attempting to do systems engineering work. However, substantial progress has been made in recent years in the development of knowledge about leadership, as an example of one soft skill. The assessment center concept was discussed briefly as a possible prototype of future evaluation approaches.

Though not identified specifically in the paper, there are needs that are worth citing:

    a. Continued research to learn what the substantive nature of the leadership phenomenon is. Such research will continue to produce progress in the development of leadership training, and will permit parallel progress in the development of evaluation techniques.

    b. Continued search for intermediate criteria. This will require the availability of organizations for study, perhaps through simulation techniques such as those Olmstead (1972) has used. Further, there is a need for enlightened decision makers who will tolerate other than face valid measures for leadership assessment.

    c. Continued work to learn how to modify an individual to be more effective as a leader.

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TRAINING QUALITY CONTROL

Evaluation of Leadership and Communicative Skills

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Testing and evaluation is a vital part of training quality control and systems engineering of training. As we continue our applications of systems engineering we are becoming increasingly aware of real problems dealing with those content areas identified as "soft skills". Whether we are capable of dealing with the soft skill areas in a systems engineered fashion is questionable.

A Few General Quotes . . .

Meckenburger and Wilson (1971): "Testing, an issue educators have slipped under the rug of collective guilt for two decades ... (p. 410)."

Glasser (1969), cited Bowers recent two-year investigation of students in 99 colleges and universities which found that at least 55 % of the students cheated on tests. Bower also reported finding a significant number of instances in which students "negatively cheated": that is, they would deliberately misinform their fellow students in the expectation that the student's standing would be lowered and their own thereby raised.

Carl Rogers (1969): "While it is clear that examination - passing ability is a useful skill, and has a place in professional training, it almost certainly emphasizes rote learning and mental agility rather than originality of thought and scientific curiosity, traits which in the long run are more valuable (p. 173)." Later Dr. Rogers observed: "It is difficult to exaggerate the damage done a promising graduate student by the completely falicious assumption that they learn by being threatened, time after time, with catastrophic failure (p. 177)."

Carver 1972: "Some day college courses on testing will start teaching students that the traditional test-building procedures are not appropriate for measuring change, or gain, or improvement but that they are appropriate only for measuring individual differences (p. 30)."

*The views expressed in this paper are those of the author and do not necessarily reflect those of the Adjutant General School or Department of the Army.

Lessenger (1971): "We have virtually no measurement of the results that our enterprise yields. All ... indices ... measure our skill as functional managers; not a single one evaluates our effectiveness as educatio al managers (p. 13)."

A Few Quotes On Aptitude and Personality Measures ...

Lee J. Cronbach (1967): during a discussion on measures of aptitudes, cited McNemar (1964) as noting the rather small success of differential aptitude tests in predicting which academic subjects the person will learn most easily. Cronbach then observed "We haven't the faintest evidence, for example, what constitutes mathematical aptitude ... (p. 27)."

Oscar K. Buros (1970): on personality assessment instruments; "Despite the tremendous amount of research devoted to ... widely used tests, they have not been replaced by instruments more acceptable to the profession. Nor has the research resulted in a consensus among psychologists concerning the validities of a particular test. The vast literature on personality testing has failed to produce a body of knowledge generally acceptable to psychologists. In fact, all personality instruments may be described as controversial, each with its own following of devotees (p. xxxv)."

Quotes On Prediction ...

Edling (1968): " ... existing paper and pencil tests ... rarely account for more than half of the variance in a criterion involving complex behavior (p. 188)." After making this observation, Edling cited Cronbach, Mitzel, and Buros as having documented this assertion.

Bond and Rigney (1970): "When well controlled transfer studies are attempted, they are often negative; a host of studies shows that school or college achievement, for example, is not very predictive of outside school achievement (p. 10)."

Doll, Gunderson, and Ryman (1969): "Prediction of personnel performance in indistrial or military settings tends to be difficult even within stable and well-defined organizational structures. Whether actuarial or clinical methods are employed, predictive validities tend to be low, and cross-validities often are insignificant."

Hoit (1965): from a review of forty-six major studies concerned with relationships between college performance and later measures of adult accomplishment:" ... we can safely conclude that college grades have no more than a very modest correlation with adult success no matter how defined. Refinements in experimental methodology are extremely unlikely to alter this generalization ... (p. 45)."

On the Measurement of Communicative Skills ...

Blum and Naylor (1969): Co-authors of a text in wide range in graduate level industrial psychology courses, and strong advocates of using selective and predictive measurements in industrial work forces; "The executive category is a most difficult group for which to develop criteria .... The problems tend to make the ..ask of objective executive performance appraisal an exceedingly complex and difficult one (p. 230)."

Stake (1971) comments: "Some technical errors in test scores are small and tolerable. But some testing errors are intolerably large. Today's tests can, for example, measure vocabulary word-recognition skills with sufficient accuracy. They can not, however, adequately measure listening comprehension or the ability to analyze the opposing side of an argument (p. 584)."

Jensen (1970): in a review of the Thematic Aperception Test; and during a general discussion of the scoring reliability of projective tests commented: "Scoring reliability below .80 is generally considered unacceptable in scoring essay examinations ... (p. 932)."

Ebel&Damrin (1960): leading advocates of the correlation or norm-referenced style of evaluation: " ... satisfactory reader reliability for composition type tests, both mark-remark and test-retest, can be obtained only when teams rather than individuals are used."

Braddock (1969): " ... it is remarkable and ironic to see that ... almost no researcher has discovered any more correlation between knowledge of traditional grammar and quality of composition than would be found, for example, between grammar and geography. (p. 448)."

Discussion and Observations ...

The preceding quotations raise serious questions about the validity of current Army Service School practices in the evaluation of leadership and communicative skills within officer professional development courses.

Typical of our present practices is the Academic Report, DA Form 1059. Tables 1 and 2 summarize selected portions of the Academic Reports from six recent advanced officer course classes at six different Army Service Schools. Examination of these data show considerable differences among the schools: differences which can with reasonable assurance be attributed in large part to individual rater differences rather than differences in talent or performance among the students.

TABLE 1. PERCENTAGE OF OFFICER ADVANCED COURSE GRADUATES RECOMMENDED FOR FURTHER SCHOOLING AND ASSIGNMENT AS AN INSTRUCTOR (Taken from the academic reports rendered on the graduates of six recent advanced officer classes at six different Service Schools: N's ranged from 38 to 175).

| | S | C | H | O | O | L |
	A	B	C*	D	E	F
Percentage Recommended for Further Schooling	96	92	–	100	99	*
Percentage Recommended for Assignment as Instructors .	49	76	–	100	71	53

*This school does not submit recommendations on these elements.

TABLE 2: EVALUATIONS OF ORAL EXPRESSION, WRITING ABILITY, AND CLASS PARTICIPATION RENDERED ON THE GRADUATES OF SIX RECENT ADVANCED OFFICER CLASSES AT SIX DIFFERENT ARMY SERVICE SCHOOLS (Taken from items 14, 15, and 16 of the Academic Report, N's ranged from 38 to 175).

	ORAL EXPRESSION %			WRITING ABILITY %			CLASS PARTICIPATION %		
SCH	Above Av.	Av.	Below Av.	Above Av.	Av.	Below Av.	Above Av.	Av.	Below Av.
A	82	12	2	31	63	6	51	45	4
B	87	13	0	79	17	3	74	26	0
C*	100	0	0	100	0	0	–	–	–
D	59	40	1	69	29	2	100	0	0
E	77	23	0	70	29	1	77	22	1
F	66	33	1	45	51	4	56	42	3

*This school submitted these evaluations on the first two elements only. Their Career Branch returned the reports directing their revision. This resulted in their adopting the policy of: the ratings rendered on the graduates of each advanced class on items 14, 15, and 16 will be distributed; 20% above average, 60% average, and 20 below average.

Although the elements summarized in Tables 1 and 2 are typically viewed as assessments of what a student learned and or demonstrated in the course, these ratings are in actuality attempts at prediction. They must be so categorized because they are relative judgments: some students possess relatively more of a given attribute than do others.

Even were all the ratings in the Academic Report normalized as one school has done (a highly improbable event) it is quite unlikely that these ratings would actually be predictive of any reasonable criteria within the operational environment. The overwhelming weight of evidence from the research literature suggests that such is not possible aside from questions of feasibility and practicality.

Fiedler (1967) observed: "Considering the fact that years of effort have failed to produce any generally valid leadership tests ... it seems safe to say that they are not likely to appear in the future (p. 250)." Later, Fiedler commented: " ... we can offer no more than speculation to account for the lack of positive results of leadership training programs (p. 253.)" Other observers have drawn the same conclusions on leadership training as well as training in communication skills. In contrast to this widely held pessimistic view of both our ability to predict leadership success and the effects of training in leadership and communication skills, Dr. Robert F. Neel[1]/, Chairman, Department of Psychology, Indiana University-Purdue University at Indianapolis, Indiana, commented that several major research efforts conducted in industrial settings have demonstrated that training in supervisory skills does have pay-off value in terms of the hard criterion of worker productivity. One unpublished study conducted by the University of Michigan Institute for Social Research demonstrated an average thirteen percent increase in productivity among the workers whose supervisors had been given special training in supervision. During the same time period, another group of workers whose supervisors did not receive the training averaged only a three percent gain in productivity. The group receiving the training and the group not receiving the training were randomly assigned from matched pairs of supervisors equated in terms of type of work supervised and the background of personnel performing the work. Dr. Neel observed, about these several studies, that none were able to predict differences in supervisory ability from the measures taken during the training. All that was predictable was that the trained group would outperform the untrained group. Who among the trained group would excell was not predictable.

What we are now evaluating about leadership and communicative skills within our officer courses and the accuracy of these evaluations is highly questionable. If the research literature is any indication, our present evaluation practices are meaningless.

1/ Personal conversation with Dr. Neel, 8 November, 1972.

Assuming that our evaluation efforts are meaningless, what alternative approaches appear worthwhile? An additional assumption underlying this question is that our efforts at training such skills will not suddenly cease: we have too much faith in the value of such training.

Similar criticism in the past has resulted in increased effort to refine our present approaches: rewriting our multiple choice questions to make them better, more realistic, less ambiguous, more challenging (discriminating? ...; training our raters to be more uniform, to produce a better spread ...; rewriting our scoring instructions, refining our definitions, redesigning the check list, (the newly published "Enlisted Academic Report," CONARC Form 736-R) revising the weights .... Our response is almost like a knee jerk. Every time we travel the same path: with about the same results. Over time our illusions vanish and we again charge in the same direction.

Let Us Try a Different Approach ...

In the following are offered a few illustrative examples of how we might proceed. There is less interest in pursuing these particular examples than in suggesting a methodology by which we might approach identification of relevant skills and knowledges related to leadership and communicative skills.

Many of our schools do involve our students in classroom exercises on how to write staff studies. We attempt to evaluate this skill. Most often, our evaluations of these writing efforts come from one rater and are usually in the form of a numerical (70 to 100) or letter "grade". On occasion we use two or more raters independently and average their evaluations. The extent of agreement among raters of compositions has been studied extensively. Rarely do the average intercorrelations among a group of expert raters average above .50. Even assuming Army Service School evaluations of compositions approach such reliability (and our scoring reliability is most probably consideredably less), is this good enough? In essence, this means that at least three fourths of the differences we see in students' writing ability come from the instructors who rated or graded the papers and only one fourth of the differences are related to the students' own efforts. And, additionally considering the large number of man hours of expensive talent invested in grading the compositions, why don't we stop? Its time we tried something else.

For example. Phrasing the "statement of the problem in a staff study"is considered of major importance. Suppose we adopt the following training objective:
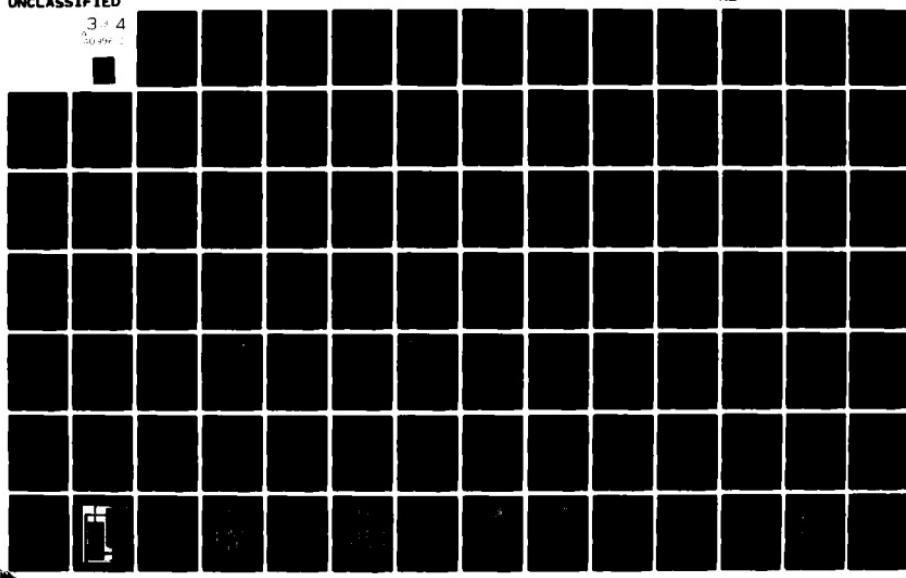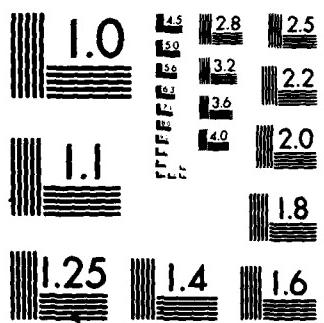
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

> Given a statement of the commanders guidance and ten different statements (two or three of which are considered appropriate and the remainder containing errors typically made in phrasing problem statements), indicate those statements considered appropriate and inappropriate.

Another training objective ....

> Given a problem statement and thirty statements together with source (a mixture of facts and assumptions), identify those which are facts, those which are assumptions, and those which are neither.

On the preceding two objectives; how much agreement is there on a given statement? How do acknowledged experts differ in their judgments vs naive individuals? Which statements cannot be judged with sufficient consensus by acknowledged experts? What recognition skills are inherent in making such judgments? These questions can be asked, and answered by an approach which attempts to issolate on one variable at a time. Now, these sub-sets of the entire writing task are obscured and contaminated by our efforts to make over-all judgments of the whole. By breaking the whole into its parts, we may be able to get a handle on some of the real skills required. If we can measure them, we can then discover how to teach them. Now we do not know what we are measuring or teaching.

One may respond to the preceding discussion: "But you didn't have the student write a problem statement or a fact or an assumption." True, but keep in mind that Robert F. Mager (1962) has trained thousands of people to write behavioraly stated training objectives but never required they "write" an objective, as part of his training.

The enormous amount of research on evaluating teacher effectiveness, most of which has been conducted in public school and university settings, is, for all practical purposes, entirely consistent in results: we simply can't do it. It is difficult to reason that we are any different in our serivce school instructor training courses.

One possible approach now being tried within the Instructor Training Course in the Adjutant General School is illustrated at Appendix A. In addition to each student preparing and presenting a "50 minute lesson", they also prepare and give their students a test. The student trainee then evaluates the results in terms of the performances demonstrated by his "students". As we seem to have learned with systems engineering, optimum training best comes about through an iterative process: a trial-test-revision kind of approach. We ask our instructor training students to identify what changes they would

make if they were to give that lesson again. We have shifted our evalua-
tion emphasis in the instructor training course away from the process and
toward the product. We have no illusions that this is an objective evalua-
tion means. It isn't. It seems to have more objectivity however than
did our efforts to assess the processes of instruction (the means, methods,
media and instructor behaviors). As we do intend that our students be able
to do something as a result of the training, why not use that as a basis
for evaluating instructor effectiveness.

The formal body of psychological research literature (social, industrial,
educational, managerial, etc.) offers a vastly rich basis for clues to iden-
tifying supervisory, leadership, and communicative skills which can be ac-
quired through training and which do transfer into relevant criterion situ-
ations. This body of literature, although in the main concerned with the
basic goals of science--description, prediction, and control; and possibly
just at the beginnings of the descriptive state--could help identify those
skills which are trainable.

Along with this search for trainable skills another set of questions will
rise. Should we teach a particular skill just because it has been demon-
strated to provide pay-off in a particular research situation? For example,
the research literature suggests that an individual's basic personality dis-
position of authoritarianism cannot be changed but that his leadership style
can be changed to non-authoritarian means. As Likert (1961) phrases this
notion: the general principle followed by high-producing managers is the
"principle of supportive relationships (p. 103)." Others have labeled this
supervisory approach a "person centered" leadership style.

Do we train our personnel in such non-authoritarian leadership skills; should
we, what are the consequences, do some leadership situations demand authori-
tarian approaches, can we train the skill of identifying which situations re-
quire a particular style? Do we actually know enough to make such decisions?
We have not had to face such questions because we haven't attempted to identify
the outcomes of our training: our measurements are too subjective and relative.
We will raise such questions by trying to operationalize, make objective, or
identify the observables within leadership and communicative skills. The pro-
cess of searching for the observables, through successive approximations,
could bring us closer to worthwhile and meaningful outcomes. We will have
lost nothing by the effort for neither the means nor the ends of our present
training in leadership and communicative skills is understood.

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EVALUATION OF TEST RESULTS FOR
50 MINUTE PRESENTATION

1. Analysis of test results shows:

	YES	NO
A. Evidence of possible deficiencies in training	___	___
B. Evidence of possible overtraining	___	___

2. Which of the following actions could be taken to improve student performance? (Check all appropriate actions.)

   A. Evaluation

   ___ 1. Change the test instrument.

   ___ 2. Change the directions on the test.

   ___ 3.. Change the verbal instructions for test administration.

   B. Instruction

   ___ 1. Select different main teaching points.

   ___ 2. Select differnet supporting materials.

   ___ 3. Select different instructional methods.

   ___ 4. Select different instructional media.

   ___ 5. Change the sequence of instructional material.

3. If actions taken to improve performance could not all be accomplished prior to the next time the instruction and tests are given, which changes must be made because they are the most important? Briefly explain your answer.

APPENDIX A to: Evaluation of Leadership and Communicative Skills

WORKSHOP CONSULTANT'S OBSERVATIONS

DR. T. O. JACOBS

The function of the Quality Control Mechanism in Training Technology is to provide answers to the following two questions:

1. What are the real world training requirements an institution must satisfy?

2. How well is this Institution satisfying those requirements?

Implicit in the second question is the assumption that some regular change may be necessary. Therefore, a correlary to the second question is, "What change is needed, and what direction should be taken?"

The four major events of the half-day program have been oriented toward one or both of these primary questions.

THE MILITARY OCCUPATIONAL DATA BANK.

User comments about MODB have been ambivalent in the past. One problem is that MODB output may not be at a level useful for training development, especially in soft skill areas where a succinct list of task statements may not be available. However, the changes anticipated in the type of data in the MODB, and plans for its utilization, seem excellent. The implications of having MODB entries compatible with CODAP programs are enormous. In research on active duty assignments of Army ROTC graduates, Scott, Powers, and Sucansky,[1] found 520 different principle duties to have been assigned to a total of 1,898 ROTC Graduates serving in 10 different branches.

These initial duty assignments covered an unbelievable variety of jobs and no one duty was reported by more than 12% of the total sample. We are currently studying duty positions held by eight key MOS in four combat arms. We anticipate that a similar outcome will be found.

This poses an almost insurmountable problem to the trainer. Changes in the MODB that we have heard described today may well offer solutions to this problem. For example, use of CODAP programs may make streamlining of the MOS structure possible, which would simplify both the problems of school training and quality control. Changes may also facilitate movement in the direction of increasing responsibility for MOS training within units.

[1] Scott, Joseph W., Powers, Theodore R., and Sucansky, Paul. An analysis of initial duty assignments of Army ROTC Graduates, Technical Report, 66-16, Human Resources Research Organization, Alexandria, Virginia, October 1966.

THE POST GRADUATE QUESTIONNAIRE.

This is a good approach to Quality Control, which should be continued. Especially for hard skills, such questionnaires provide effective diagnosis of both the quality of the training and the extent to which new field requirements may be impacting on the overall effectiveness of the training itself. However, it appears that Post Graduate Questionnaires may be relatively more limited in Soft Skill areas. Specifically, it is hard to see how they can be of great diagnostic value in soft skill areas that have not been Systems Engineered. That is, the school may not know how to ask questions about the quality of its training, and Commanders in the field may not know how to provide that which is meaningful to the school.

USER REACTION PANEL.

This technique appears to be excellent for internal quality control, when the school is concerned about the relative effectiveness of its use of training technology. However, caution must be observed in the use of such panels. First, students are not trained trainers, therefore, their comments are not to be taken at face value. If a competent training specialist is available to listen to and analyze the panel's output this would seem a quite effective way of monitoring pedagogical matters. As a second caution, the possibility of bias in any given panel suggests that several should be drawn from a class whenever such an assessment is being performed. Finally, the school or the moderator is probably a major variable. The panel we saw today was very effectively conducted.

CURRENT APPROACHES TO LEADERSHIP ASSESSMENTS.

The topic of leadership has very high salients in the military establishment, and rightly so. Leadership is what makes for superior organizational performance. In almost any situation, the more leadership there is, the better the organization does. But there are questions.

> What is it?
> How do you measure it?
> How do you develop it?
> How can you get feedback, if the developing institution nor the
> user knows how to verbalize what it is?

We have discussed a number of ways of assessing leadership, none of which are by any means perfect. It probably would be a mistake to reject them, for only with experience is it possible to learn how effectively an assesment system is operating.

There are major cautions that should be observed. It would seem that any school which presently is assessing leadership and is using that assessment as a permanent entry on the individual's records (or worse still, selecting for graduates on the basis of that assessment) may be causing gross injustices.

Thus far, only peer ratings appear to show satisfactory (but not very) validities on a long-range basis. This probably is because peer ratings measure interpersonal competence, at least to some extent. Interpersonal competence is, in all likelihood, one of the key leadership skills. However, when one goes beyond peer ratings, validities are much more tenuous. Situational tests have a strong tendency to become unreliable over a period of years (the problem is continued standardization of observers). Paper and pencil tests, especially personality tests, may be transparent and fakable. When decisions are made about the disposition of a student on the basis of scores on a paper and pencil instrument, and where the instrument is fakable, the highest scoring students may simply be the best fakers. Thus far, I know of no substantiated relationship between faking and leadership.

Research is continuing on leadership assessment, however. A leadership assessment center is being planned at Fort Benning, and an experiment will be conducted to learn how effectively leadership can be assessed, and developed/predicted through the use of this approach. While it obviously is going to be necessary to settle first on what leadership is, the assessment center approach probably is the most promising right now, with a potential for wide-spread implementation if it proves effective.

SUMMARY.

In summary, it appears that progress is being made toward the development of effective techniques for soft skill Quality Control. However, such means do not presently exist except in primitive form. While the use of these primitive forms should not be discouraged, neither should consequences to students be allowed until much more sophisticated approaches have been developed.

It would seem that an essential prerequisite for a quality control system, is a capacity for systems engineering these soft skills. Once reliable techniques are developed for this purpose, it should be a relatively simpler next step to develop the measurement techniques essential for effective quality control systems.

CONARC TRAINING WORKSHOP

FORT BLISS, TEXAS

12-13 DECEMBER 1972

Sponsored by

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U. S. Army Air Defense School

Final Report - In Five Volumes

VOLUME V

Soft-Skill Training Developments Workshop

GENERAL RALPH E. HAINES, JR.

Commanding General

U. S. Continental Army Command

MAJOR GENERAL IRA A. HUNT, JR.

Deputy Chief of Staff for Individual Training

U. S. Continental Army Command

CONARC TRAINING WORKSHOP
Fort Bliss, Texas
12-13 December 1972

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Fort Bliss, Texas

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SOFT-SKILL TRAINING DEVELOPMENTS

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SCHEDULE

FOR

SOFT-SKILL TRAINING DEVELOPMENTS WORKSHOP

13 December 1972

Hinman Hall - Room 169

Chairman: Dr. Neal B. Andregg
Educational Advisor, USAMPS

Resource Consultant: Dr. Richard W. Burns
The University of Texas at El Paso

- -

0800-0820	1300-1320	Process Procedure and Development of Soft Skill Training	CPT D. W. Garner USAMPS
		Performance Training for Military Police Noncommissioned Officers	Mr. Clarence C. Jeter, Jr, USAMPS
0820-0830	1320-1330	Discussion of Above	
0830-0850	1330-1350	Performance Based Teacher Education - A Program and Problems	Dr. R. W. Burns UTEP
0850-0900	1350-1400	Discussion of Above	
0900-0920	1400-1420	Procedures for Implementing Soft-Skill Training in CONARC Schools	Dr. J. P. Fry HUMRRO
0920-0930	1420-1430	Discussion of Above	
0930-0950	1430-1450	An Improved Army Classification Battery	Dr. M. H. Maier USA Research Institute
0950-1000	1450-1500	Discussion of Above	

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Schedule for Soft-Skill Training Developments Workshop - Continued

1000-1015	1500-1515	Break	
1015-1030	1515-1530	Field Visitation Program Briefing	Dr. C. O. Gray USAES
1030-1045	1530-1545	Use of Television and Video Tapes in the Training of Polygraph Examiners at USAMPS	Dr. N. B. Andregg USAMPS
1045-1050	1545-1550	Discussion of Above	
1050-1110	1550-1610	CONARC Project ABACUS A Prototype Computerized Training System for the Army	COL G. B. Howard Product Mgr USASCS
1110-1115	1610-1615	Discussion of Above	
1115-1130	1615-1630	Observations and Summary	Dr. R. W. Burns UTEP
1130	1630	Return to Auditorium for Plenary Session	

DR. NEAL B. ANDREGG

Dr. Andregg is currently assigned as Special Assistant - Educational Advisor to the Commandant, U. S. Army Military Police School, Fort Gordon, Georgia.

He received a BS in Education and a MA in Mathematics from Ohio State University and the EdD in Educational Psychology and Statistics from Michigan State University. Prior to his present assignment, he was Director of Evaluation and Professor of Education at the Air University, Maxwell Air Force Base, Alabama.

He is a member of Phi Delta Kappa, the National Society for the Study of Education, the National Council on Measurement in Education and several other professional organizations. He teaches graduate courses in Education for the University of Georgia and undergraduate courses in mathematics and education at Augusta College.

SOFT-SKILL TRAINING DEVELOPMENTS

SUMMARY

DR. NEAL B. ANDREGG

The seven presentations made it apparent to the participants that much progress has been made during the past year in soft-skill training developments. Performance training and testing in NCOES courses at USAMPS focus on problems with built-in stress situations, individual student performance, and the requirement to communicate and interact with others using information available prior to the application phase.

The University of Texas at El Paso has adopted a Performance-Based Teacher Education Program which has many new and interesting features. Those responsible for faculty development in CONARC schools might well consider using some of the features of this individualized program.

HumRRO emphasized a problem-solving approach to soft-skill training with seven characteristics which they have been able to try out at the Fort Bliss Modern Volunteer Army office in a Performance-Counseling Workshop. This experience may have a direct bearing on the basic characteristics of the Chemical School Advanced Course also described in this research paper.

The Improved Army Classification Battery, a ten-year project, should contribute greatly in placing personnel in the training program best suited to their capabilities. Personnel who enter the service have limited work experience and little technical training. A new selection and classification test will improve the selection procedures based on course data collected in CONARC schools.

The USAES Field Visitation Program should prove helpful to schools interested in validating their course design and in improving other school functions such as doctrine development, unit training, support for ROTC programs, and development of training literature and training aids.

The use of television and videotapes in the training of polygraph examiners at USAMPS should provide other schools with ideas for a new application of TV which aids in motivating students in soft skill training. Video cassettes can be used for problem presentations requiring individual and group solution. They can additionally be effectively employed for testing.

CONARC Project ABACUS, to be concluded in August 1976, is a prototype computerized training system for the Army which combines CAI and CMI functions. Its goal is a suitable, low cost, viable, and effective hardware

system, and a newly developed language that will facilitate course development and provide maximum flexibility. From the prototype, design specifications can be prepared to meet the needs of CONARC schools and training centers. Conferees were afforded the opportunity to observe an example of this system in action.

CAPTAIN DAVID W. GARNER

United States Army Military Police School

CPT David Garner is a career Army officer with over 8 years of commissioned service. He has served in a variety of positions in both the Infantry and Military Police. His prior assignments include duty with mechanized infantry units in the 2d Armored Division as Platoon Leader, Support Platoon Leader, Company Commander and Battalion S-3. He has held assignments as Assistant S-3 of the 504th MP Battalion, Commanding Officer, 218th MP Company and as a subarea Provost Marshal while serving in the Republic of Vietnam. CPT Garner is a graduate of the Infantry Officer Basic Course, Airborne School, the 4th Army Motor Maintenance Course and the Military Police Officer Advanced Course. He is a graduate of the University of Texas at Austin (BBA, Marketing Research, 1964) and Texas Tech University (MBA, Management, 1970). He is currently assigned as Chief, Systems Engineering Branch, Office of the Deputy Commandant for Education and Training and has worked extensively with the development of the Military Police NCOES, beginning in September 1970.

PROCESS, PROCEDURE AND DEVELOPMENT OF SOFT SKILL TRAINING

or

What To Do When You Run Out Of Excuses

CPT DAVID W GARNER
United States Army Military Police School

In December of 1969 CONARC directed the development of performance-oriented training programs for noncommissioned officers within each Army Career Management Field. The Military Police School, not unlike its sister service schools, was particularly impressed with that part of the directive which decreed that the courses would be systems engineered. In retrospect it's been a soul searching and somewhat trying two years for us. Approximately two and a half years ago USAMPS had managed to move from reading the basic NCOES letter to securing copies of CONARC Regulation 350-100-1.

It seems that now we are all immersed in the "wonders" of systems engineering, to one degree or another. Virtually every person present has probably suffered from the "It Can't Be Done" syndrome. Over the course of time the arguments, especially in the soft skill training areas, and more specifically the "people" skill areas, have centered around a lack of well-defined doctrine and terminology related to job requirements. When tasked to train leadership and managerial skills, we invariably fall back to "laundry lists" which categorically outline the 12 principles of good lesson plan development and 7 essential fundamentals of mess kit repair. Comments initially received seemed to focus on an apparent unwillingness to cut the umbilical cord tying the past with the future. Lesson plans and tests which were written five years ago, revised annually and provide a soft security blanket are no longer valid. What happened? Somebody had a better idea, but it took a long time for anybody to listen.

USAMPS, not unlike others, continued to talk the problem to death. Everybody knew what the problem was, but what was the next step. Obviously CONARC didn't mean us. Our curriculum is soft skill and too "people" oriented. Well, what's the next course of action? Our guidance from above is all hard skill oriented or it's tied to soft skills which have well-documented procedural guidance. Somehow we convinced ourselves that we had completely justified our position, but CONARC wasn't buying any of that. We came to the realization that we had just walked off the end of the pier and fallen into some deep water.

In retrospect the "sink or swim" concept was the best thing that could have happened. Not all of us grew water wings-------in fact there were a lot of us who got washed up on the beach and hauled off to the dump. Those who didn't "cross over" probably didn't for a couple of reasons.

(1) A simple lack of motivation

(2) An inherent mistrust of change

(3) The firm conviction that nobody knew as much about their instructional area and methods and media as they did

(4) An inability to swim in water, coupled with a profound belief that swimming is best learned on sandy beaches, not in water

In the NCO Basic and Advanced Courses we followed, in the limited time available the process of job identification, developing a task inventory and selecting tasks for training. We were not completely satisfied with the systems engineering materials that were developed during Step 3, Training Analysis, but generally they made more sense to us than anything we had tried before. Initially we kept hearing the words, "leadership, supervision, management, etc." The inevitable problem was how to get a handle on what leadership really is, especially in terms of noncommissioned officers. We started talking about this with noncommissioned officers in our branch. Basically they explained what it meant to them-------then we realized it encompassed a multitude of profound theories, ranging from Maslow to McGregor and far beyond. Essentially our management types told us that there were all sorts of component elements which make up this somewhat loosely defined area of leadership. Basically, in a leadership situation we use varying amounts of each of these components. Although our NCOs' comments were a little more direct and a lot more understandable than our management types' it's interesting to compare the two.

Management Calls It	NCOs Call It
(1) Subordinate Indebtedness	(1) Giving the Guy a Break
(2) Legal Authority	(2) Bucking-Up
(3) Information	(3) In-the-Know
(4) Communicative Skills	(4) Getting-Through, Rapping
(5) Status	(5) Prestige
(6) Motivation	(6) Hard-Charger
(7) Self-Confidence	(7) Keeping His Cool
(8) Task Expertise	(8) Knowing the Territory

Naturally, each of the elements shown interact to a large degree with one another and influence how effectively an individual performs in a leadership situation.

Notice how the word "situation" sort of crept into the discussion. We were learning-------now we were getting a general and somewhat foggy impression of what was floating above us.

We were ready to accept this business of leadership components, but how did we train men in this? First of all, we could lecture, and that's meant with all the bad connotations. Next, we could review lesson plans and discover to nobody's surprise that there will be the inevitable laundry list which reads something like the Boy Scout Oath. All right, if we talk about using the "tried and true" vu-graph techniques, and the associated list of "principles and fundamentals" how do we get the student to prove to us he's any better than he was the day he reported? Well, we could submerge him, along with ourselves, in multiple guess, true/false, laundry list "evaluation" instruments and other forms of perverted subjectivity. Of course this seemed to be about the same approach we'd always used.

Maybe we should see what we can find out about small group relations and what goes on, both formally and informally. Basically, our analysis centered on studies which involved groups having fairly rapid turn-over, a relatively small number of people, specific responsibilities to be carried out and defined material resources available. This sounds a lot like the normal situation in the military service, and it is. Well, what now? Invariably in these situations the group involved looked to the individual having the greatest degree of technical ability for their guidance. In occasional instances of personality deviations the tendency of the group was to reject technical expertise and resort to some modified form of democratic selection, usually acclamation based on raw physical strength, demonstrated taste in clothes, or general sex appeal.

Since we now know that expertise in the job is the first basis for assuming a leadership position, what could we do to insure that our NCO held his position without resorting to extra-legal means, to include corporeal punishment, after others in his group started to acquire some ability of their own? Well, at this point it was apparent that our leader better be able to communicate with others, and he better have or be able to get information which bears on the problems he will be faced with in his job. Just to insure he is ready to come to grasp with John Q. Hardcase, who won't accept any guidance, we'll throw in exactly what our NCO is and is not authorized to do. Interestingly enough, we wanted to build self-confidence and by design, at the end of this whole process we found that our students had acquired this as a result of reducing leadership to manageable instructional tasks.

In essence we decided that these courses we were designing had to focus on the tasks the student will perform, but moreover we had to work into these tasks a requirement to insure the student could communicate, use information, and know exactly how much authority he is carrying around with him. We're emphasizing leadership as a direct one-to-one situation in which an influence attempt is directed at another. If the receiver, the subordinate, reacts in a manner which is deemed acceptable, then we say that a positive leadership interaction has occurred. This is not to say, however, that one reaction

cannot be more favorable than another, nor is it saying all leadership is effective. It is entirely possible to have a favorable reaction, the subordinate carries out the assignment, with less effective leadership methods applied. This most frequently occurs when the legal authority aspect of leadership is the component relied upon. The subordinate reacts to a less desirable authoritative approach when a participative approach would have achieved the same end result without creating subordinate ill-will.

From these concepts we devloped our NCOES courses to focus on three critical leadership areas:

(1) Technical Expertise
(2) Communicative Skills
(3) Derivation and Use of Information

Our performance training and testing focuses on situations with built-in stress, live individual student performance, and the requirement to communicate and interact with others using information available prior to the conduct of the application phase.

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MR. CLARENCE C. JETER, JR.

United States Army Military Police School

Mr. Clarence C. Jeter, Jr., is a member of the U. S. Army Military
Police School staff. His experience includes that of Training Instructor
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PERFORMANCE TRAINING FOR MILITARY POLICE NONCOMMISSIONED OFFICERS

MR. CLARENCE C. JETER, JR.

United States Army Military Police School

Once it was determined that the United States Army Military Police (USAMPS) would follow the letter and the spirit of the systems engineering concept many interesting training problems developed in the soft skill area. The question that we finally became engrossed in was based on how to train Law Enforcement Noncommissioned Officer Basic students. How could the school develop learning situations which would transfer to the field? How could a large number of realistic situations be developed? How could a simulated job environment be created within the existing training facility?

The first guideline established was that tasks performed in the same environment would be grouped. The resulting sequence was to have military police post, camp, and station operation tasks, military police company administration tasks, and MP tactical operation tasks grouped as the broad functional areas. This arrangement later allowed functional organizational delineation within the Noncommissioned Officer Group. The training objectives were analyzed and found to be directed toward three instructional goals where the student must learn to: solve problems and make decisions; perform program and operational planning; and display attitudes appropriate to his position. The size of the class, the type of classroom or training area, and the methods of instruction were dictated by this analysis and the philosophy of performance oriented training.

Classrooms were designed to support practical exercises in two of the three functional areas by environmentally simulating the actual job conditions at a military police station and an orderly room. The physical layout includes areas for four student and eight student work groups, as well as for the full class. Optimum class size was determined to be 16 students with a maximum class size of 20. Telephones were installed at each student practical exercise position; a switchboard was set up for instructions, carrels were made, and tables, chairs, office supplies and manuals were provided for each student. Post maps, notification charts, and military police station standing operating procedures were prepared and printed so that normal job tools would be available. Speakers and noise tapes were included in the training area to simulate as much of the desired real life environment as possible. While the classroom falls short of the real orderly room or actual military police station, it is a far cry from the regular "dressed up" lecture room that had preceded it.

With the classroom arrangements cared for, the next step was to identify and develop outside training areas to support tactical instruction and traffic accident investigation training. Fixed checkpoints were established to train for population and resource control operations and suitable areas were located to support mobile checkpoints. Cars were bought, accidents staged, and scripts were written for support personnel playing parts in accident investigation. Other training objectives requiring an outside training area were planned.

The problem solving techniques selected to train in soft skill areas led a small number of instructors to the giant task of developing large numbers of realistic training problems. It was felt that unless the problems were "real" that the chance of transfer would be small and motificational edge would be lost. The instructors' problem surfaced at the same time a Military Police Advanced Officer class was finishing its training cycle. These officer students had about four or five years of experiences which related to the military police noncommissioned officer job. It was decided that this group could make a valuable contribution to the course development process by writing down typical situations and solutions whcih they actually encountered as military police operation officers, military police duty officers, and assistant provost marshals. Within one week over 450 problems were received by the instructors. After quality control action was completed there were about 150 solid, real, usuable training situations on hand for use within the military police post, camp, and station operations segment of the course. These realistic situations are used for testing as well as training. The instructors had to fall back the regular methods of problem-development for the other segments of the course; long, exhausting work.

The Military Police School feels that a major element in the successful leader is the ability to communicate. Plans were made to insure that the students had to communicate with the types of people they would be confronted with on the job. These plans did not include subject matter blocks of instruction labeled "Communication Skills"; instead, communication skills are taught in context with the job at hand. An example of this is desk sergeant job which includes such tasks as receiving complaints, determine authority and jurisdiction, and make emergency notifications. The desk sergeant has to communicate with almost every form of life and be able to perform the procedural parts of the tasks at the same time. The practical exercises developed for this area of the course include the student talking over the phone, taking information from persons at his desk, and giving instructions to subordinates; all within the framework of solving job related problems. Just to insure the complete environment, the noise level in the classroom is maintained through tape recordings of appropriate background sounds. The Military Police School thinks that if the student experiences this training and passes the performance tests related to this instruction, he leaves this program at a reasonable level of competence.

The requirement for the student to learn to display certain attitudes during the performance of various tasks has caused some interesting instructional situations to be developed. There is not much trouble learning to write a ticket for some traffic violation when all it amounts to is taking information from some practical exercise work sheet and placing it in the right block while sitting in a classroom. Try the same task when the information giver is crying, angry, or drunk. The student investigates accidents where the drivers of the cars involved begin fighting or give conflicting views. In community relations areas the learners are bombarded with emotion laden insults so that they can learn to handle their feelings and their job at the same time. Through this instruction students are expected to act as professional law enforcement officers and competent noncommissioned officers. The student's first response to these situations is that they are part of a light game but as training goes on the "game" becomes heavy enough to cause many a stressful moment. Note should be taken that there is no block of instruction called "attitude Shaping"; this training requirement is spread across the objectives by being addressed wherever it can be considered a real part of the job. The course supervisors and instructors have been very cautious about not putting stress in situations that actually do not call for it. The danger is selecting this approach to instruction is that the student material will be flat and uninteresting if it is too mundane or it can be a joke if the students perceive situations as fantasies. The noncommissioned officer student is generally well grounded in his job and is quick to discriminate between the real and the unreal. Experience with advanced and basic officer training, as well as the noncommissioned officers, has shown that this factor gains importance as the job background of the student increases.

The noncommissioned officer education program in the Military Police School has produced gratifying results. The testing effort is providing information which is usable in making the necessary adjustments in the systems engineered program. Current performance examinations are a far cry from the old multiple choice or essay tests relied on in the past. Field feedback has been good and it seems the graduate is being well received. Many of the positive aspects of this track have been picked up by related courses and it served as a prototype for other Noncommissioned Officer Educational System programs at the Military Police School. Problems continue to show up during normal operations and they are dealt with as a matter of course. The most interesting factor coming out of systems engineering of soft skill courses is just how visible real training problems can become!

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PERFORMANCE-BASED TEACHER EDUCATION

A PROGRAM AND PROBLEMS

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The terms performance-based learning or competency-based learning are synonomous designations for a new movement in American Education. Change has been described as one of the sure things in life, but public education at all levels has not been known as an institution responsive to change. Although at first glance "schooling" has changed from the "little red schoolhouse" of the 1800's to "glass-brick plants wired for sight and sound" in the 1900's, the basic learning process has remained frustratingly rigid. Even in the military and industrial segments of our society, the educational or training endeavor, although more responsive to cultural or immediate demands than public education, still falls short of the idealized expectations of educators or trainers.

Recently, signs of a rather sweeping reform, most commonly called competency-based education, has captured the attention of all segments of our society. This movement is on the verge of practical realization because of three forces: social forces -- the demand for relevancy, effectiveness, accountability; technological forces -- management and systems strategies, communication devices, print and non-print innovations; and behavioral science forces -- new insights into learning theory, performance objectives and individualized instruction.

Exactly what is competency-based education? It probably should not be defined and it positively cannot be described. However, it seems to have in all of its variations two major characteristics: (1) it is goal or objective oriented and (2) it emphasizes the individual learner. However, these two characteristics of learning are far from new; in fact, they, by, necessity, have characterized human learning since humans first "became." What then makes competency-based education a new movement? It is best viewed as a present-day, systematic attempt to implement directed learning in an effective manner -- a goal long sought but to date difficult to achieve. Now, because of increased understanding of how individuals learn and technological innovations, competency-based education has a

realistic chance to succeed where other programatic attempts in the same direction have failed.

Competency-based education does these things:

1. It defines the probable results of learning in specific performance terms.

2. It demands that the learning process be accountable for the described performances, and

3. It recognizes and implements learning as an individualized process.

Associated with the competency-based movement are such things as: learning packages, teaching machines, consortial decision making, and criterion-referenced tests. These features are <u>not inherent characteristics</u> but rather <u>means</u> being employed to reach competency-based goals.

With this introduction, I wish to devote the rest of this paper to a brief description of a specific application of competency-based learning; namely The University of Texas at El Paso's Performance-Based Teacher Education Program. The project started in the summer of 1970 when the University was invited to participate in the development of experimental performance-based programs in Texas. The U.T. El Paso component proposed an experimental design which was to be a model applicable to any educational level. The major features of the experimental program were:

1. A product analysis to help determine the appropriate behavioral objectives.

2. Professional staff retraining and development of objectives.

3. Development of instructional modules in three core areas: professional-technical, psycho-personal and social cultural.

4. Individualized (self-paced) instruction.

5. Specialized field experiences.

6. Group seminars.

7. Computerized management system.

One additional purpose of this project from the University's viewpoint was to start doing what we believe others could do. We wanted to show teachers something about how they could, in turn, be teaching. A further purpose from the State of Texas point of view was to establish the feasibility of and gain experience with performance-based teacher training with some expectation that in the near future such programs would characterize all of teacher training within the state.

Let's take a further look at each of the seven major features of the U. T. El Paso experimental program which is now being implemented in the classroom in its third year. Objectives and job-task analyses are not new to the military and they are not novel ways to decide on appropriate objectives for a training program. Perhaps product analyses have also been functional in program designs but they are less well known and less widely used. In one sense, a product analysis goes a step further than the more traditional job-task analysis. In our program the product analysis went like this:

1. Study the educational product -- the learner -- to determine in so far as possible the performances expected of the product as a result of learning.

2. Infer from step 1 the teacher performances which would be required to produce the product.

3. Assess the performance repertoire of each entering teacher training intern.

4. The required performances defined in step 2 minus the performances identified in step 3 become the individualized performances expected as a result of learning in the performance-based program.

Being aware of the limitations of time, available techniques and available students for a product analysis, a supplementary and to some degree a back-up method for deriving program objectives was also under-taken. This second feature of our program also was intended to help meet a concurrent objective of the project; namely, staff retraining and development. In this instance, each staff member who regularly taught a course within the traditional teacher-training program was asked to write an idealized list of terminal-behavioral objectives for that particular course. They wrote the objectives after a training session on "Creating and Writing Objectives". A group of experts reviewed, rewrote, selected and finally sequenced all the objectives (those developed "in house" and those resulting from the product analysis) into one comprehensive set for the program.

Once the scope and sequence of the program was determined, the pre-planning of the instructional process itself was undertaken. It was decided to develop instructional modules following a common format where possible. This third feature of the program, the modular design, allowed the program, in its process phase, to be self-paced with alternative methods for learning. There was no insistence that each module be of any given length or design but rather that the format be adapted to the objectives selected for that module. Whereas the majority of the modules were similar, especially in the professional-technical core, diversity did occur, mainly in the social-cultural segment and to some degree in the psycho-personal core. The suggested format for the instructional modules consisted of these features:

1. Title page

2. Objectives

3. Overview

4. Pretest

5. Rationale

6. Instructional alternatives

7. Post test

8. Resources[1]

The important features of the modular design which helped implement the performance concept and individualized instruction were the objectives, the tests and the instructional alternatives.

This leads to the fourth feature of the U. T. El Paso Performance-based program, individualized instruction. The term "individualized instruction" has many meanings, a conclusion I have reached after attempting to read about it and observing many instances of its purported application in the field. It is remarkable how many educators confuse individualized instruction with independent study. The latter, independent study, could and sometimes does, merely mean studying by yourself -- alone -- not in a group. The intent, however, of individualized instruction is to effect a "best fit" between the individual learner and the process of learning.

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[1]For a more descriptive treatment of an instructional module design see R. W. Burns, "An Instructional Module Design," Educational Technolo Vol. 12, No. 9, September 1972.

Essentially the concept of individualization encompasses three vari-
ables; time, method (how) and content (what or objectives). Time
as a variable is a must in individualized learning. All evidence
shows that learners do indeed have unique learning speeds and,
further, that given time the vast majority of learners can achieve
stated objectives. There are a few instances where exceptions to
time as a variable must be made in a practical sense; especially
where cost-effectiveness is a major program consideration. Further,
evidence that time is a necessary variable is found in the true mean-
ing of the commonly expressed phrase, "a slow learner" -- a person
who can learn or achieve but who merely needs more time than
generally allowed by our present lock-step educational systems.

The second essential variable in individualized instruction in-
volves the method by which one learns or the "how". It is safe to
say that, from what we know about learning as an interactive process,
no two learners learn exactly in the same way or manner. In my
previous comments about the instructional module design, I made
reference to the part entitled "instructional alternatives" as being
one of its major features. The intent of providing instructional
alternatives in a module is to implement "individualization of
instruction" by making available to the learner alternative methods
or ways in which he may attempt to attain the objective of the module.
In practice, the alternatives offered represent, whenever possible,
distinctive instructional situations with which the learner can interact.
For example, one alternative could appeal to the visual sense, another
to the audial, another to the tactile; or one alternative could be textual
reading, while another could be a slide tape and yet a third, programmed
instruction. The variations in alternatives possible are only limited
by the module designer's imagination. Here is a list of thirteen general
types of instructional alternatives, each of which has many variations:

1. Film

2. Sound Film

3. Slide Tape

4. Tape

5. Reading

6. Lecture

7. Programmed Instruction

8. On-the-job

9. Observation

10. Study-guide question plus bibliography

11. CAI

12. Any combination of the above

13. Do your own thing

The third essential variable in individualized instruction is rarely permitted, encouraged or provided for; and that is, freedom for the learner to select or create his own objectives. Arguments for and against student selection or creation of objectives can be made and in specific skill or occupational training, as frequently found in military schools, there would obviously be restricted opportunities for learner choice as compared to areas where the objectives are more general.

Returning to the major features of the U. T. El Paso experimental program, the fifth feature dealt with specialized field experiences. Traditional teacher-training programs have some on-the-job training and generally include one or more courses entitled "practice teaching". For years there has been considerable dissatisfaction with this traditional approach; mainly because it was felt that teacher-training would be more functional if there was integration between theory and practice. Field experiences as conceived in new programs attempt to provide a functional relationship throughout the whole training program between University classes and public school classrooms. On-the-job observations begin early, and many modules, especially in the psycho-personal core, require specific field experiences as part of the module process. Thus, the teacher trainee becomes acquainted with the realities of teaching early enough so that his understanding of and perception of the need for professional training can be motivating in the academic phase of his training. Additionally, his appreciation of the school system and the role teachers play as well as new attitudes towards students, professional staff and program are formed prior to teaching rather than following employment.

A sixth major feature of the program is the provision for scheduled group seminars. These group sessions are intended to function as problem solving sessions and process events where the attainment of affective objectives is of primary concern. Feedback to the program by the trainees is also a probably outcome although how extensive and effective the feedback remains to be seen.

To implement the program by way of record keeping and feedback for program improvement, a computerized management system was designed. Data provided by the system will allow the making of statements about and drawing conclusions about:

1. Learner progress -- modules successfully completed.

2. Number of modules being utilized at any point in time.

3. Elapsed time spent interacting with each module.

4. Laboratory time spent interacting with each module.

5. Number of modules completed by individuals per unit of time.

6. Difficulty of modules as measured by elapsed time and number of recyclings.

7. Frequency of recycling for each module.

8. Individual trainee pattern of modular interaction.

9. Number of tests administered -- total and per module.

I have just described the essential features of the U. T. El Paso experimental program. In practice, minor exceptions and deviations from original program design have been permitted because of the realities of factors as: available resources, including financial support; available staff; space requirements; staff personalities; time and administrative constraints. To date, all the modules in the professional-technical and psycho-personal cores have been pretested, some of them revised and they are now available for use both within the experimental program and to any staff member who may desire to use them within some segment of traditional classroom teaching. In this, the 1972-73 school year the program is being fully implemented for the first time.

As you might guess, the whole project has not escaped the plague
of expected and unexpected problems which characterize most novel educa-
tional efforts. The major problems to date have been concerned with the
specification of objectives, the development of modules in the socio-cultural
core, the training and utilization of staff and the management of program
information. If this project is to be implemented as a regular program
rather than an experimental one, additional problems will undoubtedly
arise dealing with "change in traditional University procedures." These
changes will be concerned with individualized instruction, degree credit,
traditional grades, final examinations and other such features of "common
college requirements".

Looking briefly at the problems experienced to date, the first major
difficulty experienced was determining the scope of the program. It is
easier to specify objectives for job skills in areas where there is little
or no major human involvement; that is in science areas where human
relations are administrators' responsibilities. It is extremely difficult
to identify specific skills needed by teachers. That this is so is no reason
to back away from the problem. In fact, the designing of a program and
then observing and evaluating it as a process is the only way in which
greater understanding of teaching-learning will come about. If properly
conceived and implemented, the performance-based teacher education
movement will, in the next few years, provide unparalleled opportunities :
educational research.

The development of socio-cultural modules has been a problem because
of lack of understanding of what is needed and lack of agreement about what
should be done. In areas where affective learning, as opposed to cognitive
and psychomotor learning, is the major objective there appears to be little
concensus concerning conceptual strategies for implementation. Again,
the key to greater understanding of the problems involved depends on
program design and long term evaluation of consequences.

Staff training, retraining and integration is typically difficult in
any new comprehensive and systematic change in institution functioning.
Such problems are particularly difficult in the field of education which
has been observed to be traditionally conservative and "change resistant".
An additional factor operating in opposition to change which is somewhat
unique to a university culture is the notion of "academic freedom". It is
not that academic freedom, per se, is an inherent impediment to progress;
but rather, some individuals interpret the freedom concept in ways which
appear to be "self-protective". Newness can always be expected to be
"suspect" and "resisted" so that careful attention to in-service training
and staff involvement, beginning with program conceptualization and extending
throughout the life of the program, will more than justify the effort. There

is no substitute for personal committment to what one is doing, and, unless every staff member associated with a project has a significant opportunity to interact with the project, there can be but slight hope for the program to be a success.

For any program to be continuously effective, whether the program is traditional or experimental (or is known by any other name), it must be subject to adjustive control. This is merely a way of saying that any system to continue to be effective (work) and to be increasingly efficient in achieving any defined goal, must change. It is not easy to change any system in functionally effective directions. Change in effective directions requires definite kinds of input, for without input there can be no output. Short of the alchemists' dreams you can never get out of any program products whose components are not put into the program. Some type of "system's management" must be applied to provide feedback (input) into the system. In our program, to make observations about module effectiveness as instructional events we must collect descriptive data on such factors as: learner interaction time with the module, the number of posttest attempts, recycling events and elected instructional alternatives. Such descriptors enable one to have some knowledge applicable to second generation module design and the way the population of learners being served interacts with the modules. Since the specific bits of information desired are extremely numerous, it is only appropriate to provide technological assistance in its management. For this reason, computer assistance is a most likely choice for this phase of management. In most educational systems, additional data for administrative reasons is also desired. For space assignment, material needs, individual progress, grades, degree credit, staff assignment and similar needs a large amount of data must be recorded. Again, a computer appears to be one solution to the storage and retrieval needs of the program.

Finally, I would like to make some observations about the performance-based movement in the United States. These are based on broader knowledge than that provided by observing the U. T. El Paso experimental program by itself. First, the state of Texas now has legal committments to require, within a five year transition period beginning September 1, 1972, the development and implementation of competency/performance-based programs of teacher education leading to teacher certification. All new programs approved for an institution (college or university) after September 1, 1972, must be competency/performance-based and all presently approved programs must be converted to performance programs by September 1, 1977. Second, this requirement of the State of Texas is not unique as evidence of interest in or committment to the competency concept. Utah, Kansas, Nebraska, California, Oregon, New Hampshire, New Jersey, Minnesota, Florida, New York and Washington are known to be actively planning in this direction. Although it may be slightly premature to predict, it does

appear to me that the performance concept will either be required or permitted by all states within a three to five year period. Such sweeping change has not previously characterized teacher training in this century. What the final outcome of all this portends is even more difficult to assess at this point in time. However, one further inescapable observation can be made. The training of teachers directly relates to the products they produce -- the school children of the United States. It appears safe to assume that performance elements will be characteristic of all phases of learning within a short period of time. Hopefully these changes will not be "change for change sake" but also will produce better adjustments to the problems facing education in the United States today.

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PROCEDURES FOR IMPLEMENTING
SOFT-SKILL TRAINING IN CONARC SCHOOLS

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During the past nine months, one-half of Work Unit MODMAN efforts have been directed toward investigating procedures for systems engineering soft-skill job functions (e.g., command, supervision, and leadership) such as are found in Officer Advanced Courses (C-22) and similar career-type instructional programs.

As some of you may recall, a two-page outline of a general approach toward soft-skill training was included in the questionnaire which we sent to all CONARC schools to help us define "soft-skills". Respondents were asked for their reaction and other possible approaches. So, first, I'd like to discuss briefly those reactions.

Second, I'm going to describe how that approach fits with the approach taken by the Chemical School in their C-22 course.

Third, and finally, seven areas for improvement will be outlined. In general we feel that our efforts should have considerable impact on soft-skill training effectiveness in CONARC schools. We invite your comments and criticisms.

Reactions to a Problem-Solving Approach to Soft-Skill Training

Basically, we proposed that soft-skills could be learned best by an instructional approach (system) which was based primarily on a problem-solving framework or structure. Obviously, as change occurs or as time passes, memorized facts have a very short life-span. In contrast, solving problems is not only far more meaningful to the learner, but it is also more transferable to future job assignments, especially where unique or novel situations not now anticipated or foreseen will be encountered.

The characteristics of a problem-solving approach include:

1. A job function orientation. The focus is on broad-based job functions or skills that cut across any job requirement.

2. An experiential orientation. The active participation and involvement of the learner in performing is sought, rather than just reading or listening.

3. A simulation orientation. Transfer of training is enhanced by practice in problem situations which simulate those found in real-life, on-the-job, assignments; problem situations are complex, ambiguous and emergent.

4. A cooperative-evaluation orientation. Opportunities to experiment with new techniques, to make mistakes, and to receive immediate feedback (primarily from peers) are emphasized. Evaluation is for feedback purposes (knowledge of results) rather than for competitive (grading) purposes.

5. A functional context orientation. Concepts and principles are introduced when the student needs them. Self-instructional materials are the primary means of learning basic concepts and principles.

6. A small-group orientation. Small groups or teams of students are formed, each with a learning "facilitator," rather than one lecturer for a whole class. Peer instruction is employed whenever possible.

7. A learning- and student-centered orientation. Since student learning is the goal, students needs are met on demand by immediate administrative response.

Appendix A includes initial proposal, basic reactions to it, reservations, and other approaches recommended by respondents. In summary, reactions were very encouraging; 77% of the respondents actually wrote down positive remarks like "Excellent!" or "I like it very much....". More noteworthy was the remarkable amount of agreement among respondents. In fact, several schools have either already established a similar instructional approach or are planning to do so.

Reservations to the approach centered around two problems: how to obtain the kind of instructors required and how to evaluate students without being overly subjective. Chaplain O'Shea of the Chaplain School, having had experience with a similar approach, provided two insightful comments: (1) learning through "discovery" while in the process of "doing" something, and (2) introducing cognitive information at the point of need, so that it is most useful to the student (functional context).

Other approaches recommended by respondents included specific methods such as In-Basket, Case Studies, Micro-Teaching or having students attempt problem-solving without adequate resources or time. Remaining suggestions were quite heterogenous, but all could fit within a basic framework of problem-solving.

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In conclusion, there seems to be much support among CONARC systems
engineers for a problem-solving approach to the soft-skill training. Let
us look now at the Chemical School's implementation of such an approach.

The Chemical School's Problem-Solving Approach

In early June, I visited the Chemical School at the invitation of Mr. Thomas
E. Chandler, Educational Advisor, and LTC Thomas R. Roark, Advance
Course Director, to evaluate their re-designed C-22 course.

The Chemical Officer Advanced Course had had a general history of dis-
satisfied students. That is, they were either unmotivated, complained all
the time, or dared instructors to teach them. This is typical behavior, I
understand, of Basic and Advanced Course students.

In the old system, there was little coordination among instructors or
departments. As a consequence, each instructor hung his piece of
"important" knowledge on students as they passed that instructor's station--
exactly like an assembly line. Further, instructors were concerned more
with how to lecture than with how students learn or with how they will use
information once they take up job assignments.

By backing off far enough from the compartmentalized structure of the
original course, LTC Roark and his associates were able to make use of the
systems engineering principle of job analysis. That is, they identified that
the graduates basically ought to be able to solve problems and make decisions.
Furthermore, from now on, due to the variety of job assignments, only five
to ten per cent (5-10%) of the graduates' time would be spent functioning as
chemical-oriented branch officers. Thus, they would soon be required to
solve a variety of problems, most of which would be unrelated to their pre-
vious "hard-skill" experience and training. (NOTE: Chemical branch
officers seldom ever become commanders, mainly they serve as staff officers.)

In fact, when incumbent commanders were asked what abilities they most
desired in Chemical Corps officers, problem-solving ability ranked right
behind proficiency in CBR. Other broad-based job functions were also
identified, such as interpersonal and communication skills. A Graduate
Profile was derived (Appendix B) which was quite general but met all identi-
fied on-the-job needs. When more specific training objectives were proposed,
only arguments ensued. It was clear to them that task inventories, as advo-
cated by conventional systems engineering procedures, were trivial and
unsuited for the "soft-skill" training required by Advanced Course students.

Thus, LTC Roark's primary training goal became devising an environment
where students could solve problems within the context of the jobs these
officers might encounter.

Problem-Solving As A Framework

Most of you are aware that in most educational settings, if problem-solving is required of students, it is quite specific. That is, problems and methods of solution are well specified and the student is evaluated on his arriving or not arriving at a correct solution-- not on his ability to identify the problem, to select the best method of analysis, or to analyze the problem and develop possible solutions. Likewise, under conventional methods of instruction, the learner leaves a course mostly with answers to "old" or routine problems, not necessarily with skills in how to solve new or emergent ones.

However, if students are required, as they were here, to seek out and apply information in solving non-routine problems that closely approximate (simulate) typical officer on-the-job performance requirements, it follows that not only will they be able to begin functioning effectively once they face on-the-job problems, they will also know how to seek out knowledge from whatever resources are available--be they TMs, ARs, SOPs, peers, staff members, subordinates, or consultants. Thus, they become skilled at locating information and using it, rather than just becoming repositories of rapidly aging knowledge. However, as far as knowledge acquisition goes, they don't learn all of the information normally spewed out in lectures; rather, they learn, through inquiry and initiative, to find samples of that whole--that which is relevant and meaningful toward solving realistic problems. It should be noted that such a problem-solving framework or "hollow shell" easily accommodates all subject matter presently perceived as essential to graduates, or any new information which may become required learning in the future.

The Chemical School's Advanced Course 36 weeks of training is roughly split into six phases or six levels of command (each can be conceptualized as a learning vehicle):

> Phase I--Company/Battalion
> Phase II--Brigade
> Phase III--Radiological Safety - Prefix 5
> Phase IV--Division
> Phase V--Installation (CONUS Base)
> Phase VI--Higher HQ/Logistics

(NOTE: Phase III, Radiological Safety, is taught by conventional instructional techniques, as it is quite quantitative/technical and apparently fits that instructional methodology quite well.)

The reason for six phases is functional. As graduates progress upward in organizational levels of the Army, they will be asked to solve similar

problems (e.g., drug abuse), but at different levels of complexity. In other words, during the 36 weeks (except during Phase III) students might encounter the same problem five times, but at increasingly more difficult and more complex levels.

Problem situations were derived from many sources, but the emphasis is on "realistic" situations where problems are imbedded in the information supplied. A local chemical battalion contributed many problem situations which fit an initial "in-basket" type instructional methodology. In later phases of the course, problems were introduced via operations orders. There were no school solutions and often no final solution was required. Students usually were required to brief a field grade officer familiar with the problem area before complete analysis could be carried out.

Small Groups and Evaluation

To implement the problem-solving approach, small groups of four to six students became the basic instructional unit. A small group format provides students with opportunities to help each other learn. At this stage of professional development, it's not too uncommon for a given student to be more knowledgeable and more experienced about a given topic than even instructors. Thus, evaluation, in the form of immediate feedback, can be meaningfully given by one student to another student. In fact, students are often more willing to accept and to learn from their mistakes if evaluation is in the form of immediate feedback from peers. Moreover, learning from mistakes is enhanced and small groups can become teams in which cooperative learning takes precedence over competitive learning.

Nonetheless, students were critiqued daily by consultants and "rented faculty" who evaluated their products (analyses and briefings). Criteria were no longer based on how many facts students knew, but could they use factual information. The level of criteria became analogous to that of the real world, where a general evaluation is more relevant to success or failure. In any event, except for CONARC requirements for class standing (top 20%), competitive grading was eliminated.

Student-Centered Learning

Instead of platform lecturers, instructors become resource personnel capable of consulting with student groups and advising them in their solving assigned problems. The emphasis was on learning and student control of that learning.

Each of the six phases is coordinated by a Phase Leader, who is assisted by faculty consultants--experts in that particular phase. Consultants were only required to be available for two hours per day during their five to six week

tour of duty. Since they served only as resources (they had no lesson plans, films, or slides and gave no lectures), student teams met with them during the two hours as they felt it necessary. Thus, in a typical 40-hour week, there were only eight (8) hours that required student attendance (e.g., guest speakers, seminars, or electives). Although students were able to come and go as they pleased, in practice, assigned problems caused them to work many more than 40 hours per week.

Summary Thus Far

So far we've discussed an instructional approach to soft-skill training which is problem-solving based. It includes experiential learning in small groups. Students solve simulated, job related, problems by means of broad-based job functions, acquiring information in a functional context. Students are in control and are evaluated non-competitively. Thus, all seven characteristics outlined previously are utilized in the Chemical School's C-22 Course.

Seven Areas For Improvement

The first class to learn under the new system was about three weeks from graduation when I interviewed one team of six students. In general, they considered their training to be worthwhile because they were learning information through solving realistic military problems. They acknowledged that their motivation to continue learning, even during the final weeks of the nine-month course, resulted from: (1) peer pressure, (2) a past history of satisfaction from having achieved meaningful learning, and (3) the challenge of the present problems.

Nonetheless, they felt several areas needed improvement. Likewise, our experience here at Fort Bliss in developing and testing out an instructional system very similar to that of the Chemical School, but much shorter, suggest that a number of improvements can be made without destroying its integrity or viability.

While working on MODMAN concepts and procedures, we have been fortunate to have been able to try them out in a Performance Counseling Workshop, which we had previously developed for MG R. L. Shoemaker and the Fort Bliss Modern Volunteer Army (MVA) office. As it turned out, the workshop gave us plenty of time to repeatedly test out our new methodology, evaluate its "bugs", revise it, and then re-test it. Thus, our final produce incorporates a number of methodological innovations which should help to improve the basic characteristics of the Chemical School Advanced Course.

The Performance Counseling Workshop

In general, our workshop is problem-solving based. In fact, students learn to be. ome facilitators of both individual and group problem-solving. Likewise, it includes the seven characteristics mentioned previously: broad-based job functions are learned experientially via solving simulated problems in small group settings while information is acquired in a functional context under student-centered conditions a.id where immediate evaluation from peers is emphasized.

The basic instructional design can be conveniently viewed as a sequence of five training methods which approximate more and more closely real-life situations. Table 1 lists these five training methods, each of which reflects a degree of approximation to on-the-job performance, along a "fidelity of simulation" scale. Associated student behaviors and training objectives, as well as the training goal (behavior application on-the-job) are also listed on the table. (NOTE: In a course (e.g., C-22), this sequence of training methods would be repeated as many times as necessary.)

Training Methodology

The first training method, introductory briefing, is used only for student motivation and overview purposes. Nonetheless, feedback from students is sought so as to determine students' entry level and to detect misperceptions of training intent.

The second training method involves self-paced learning of concepts and principles by means of self-instructional, modularized materials where actions, conditions, and standards are specified. As soon as a student feels that he has learned the objectives for each module of the material, he can test himself (Method 3). Nonetheless, such cognitive/verbal learning is integrated with skill acquisition as much as possible, thereby making use of the "functional context" principle of training. Also, peer-instruction is emphasized wherever appropriate.

The last two training methods require that small groups of students be formed, each with an instructor or learning facilitator. His function is to serve as a learning resource to the group, to insure quality control and to guarantee a risk-free environment. Class time is devoted to either observation of behavior or repeated practice of analytical or behavioral skills in simulated problem situations. Thus, all students in each group either observe or take part as participants. Observers are at least able to react to the problem situations vicariously, enabling them to participate constructively in debriefings that follow.

In general, initial simulation exercises are very short and simple, with clear-cut solutions, requiring direct application of only a few skills (similar to micro-teaching). Later, as students become more confident and more skilled, the level of fidelity of the simulated problem situations is correspondingly increased in complexity and difficulty. The goal is to maximize transfer from the training environment to the job environment.

A Basic Difference

In the Chemical School Advanced Course the emphasis is on obtaining depth of content by concentrating on acquiring information through the development of solutions to simulated problems. Although students try to find out how to best use information, analyzing and identifying strategies, processes, or methods of attack are not the focus of learning. Effective processes are supposed to emerge, somehow, from the act of problem-solving--i.e., trial and error learning. Of course, learning from peers, using past experience or modeling on consultants are typical trial and error methods of acquiring processes.

In contrast, both we and the Chaplain School focus on obtaining depth of content by concentrating on processes--the how of getting things done. For example, both of us would be interested in how to lead small group discussion or how to handle or counsel an over-emotional soldier. In addition to advancing specific process techniques, we both state behavioral objectives at the outset. (NOTE: In the Chaplain School Advanced Course students are given much more freedom to modify objectives and MOI than in our workshop. However, they are less problem-solving oriented, since command or leadership positions are not of interest to them.)

Recommended Improvements

What follows are seven recommended improvements to the basic characteristics of the Chemical School's C-22 Course. Some of them also apply to the C-22 Course at the Chaplain School.

1. Behavioral Objectives Should Be Made Known. Students should know what behaviors they ought to perform, what conditions will be present, and what typical performance criteria or standards are. The Chemical School Course designers, in an effort to create a student-oriented instructional environment, purposively refrained from prescribing what was to be learned because they felt students should "discover" processes or techniques for themselves.

This approach led to confusion and anxiety, forcing students to band together to try to discover what the consultants really thought was a good analysis, etc.

Although such ambiguity is representative of real life and promotes peer cohesion, it makes learning difficult. Researchers who have studies "discovery" as a learning technique are convinced that for exploration to be m²aningful, the objective of the task must be known and the learner should know where he stands with respect to it (Bruner, 1968). In fact, tasks that are too uncertain, arouse so much confusion and anxiety that exploration behavior is reduced.

Previously, it was mentioned that a task analysis of Advanced Course content led to trivial entries. This does happen if the focus is on content alone. But a behavioral analysis of processes that make up any larger or broad-based job function can produce a hierarchical sequence of specific skills that are not trivial (Whitmore, in press). Thus, the systems engineering steps are valid for soft-skills. All that is needed is a process point of view rather than content.

   2. A "Guided" Discovery Instructional Format Ought To Be Adopted. "Guided" Discovery allows:

      (a) Efficient acquisition of concepts and principles novel to the student. He does not have to waste time and energy reinventing the wheel.

      (b) The student to test out novel concepts and behaviors so that he can convince himself that they work. This is especially useful when behaviors contrary to his experience and background are ones he ought to be using.

"Guided" Discovery begins with a general specification of behavioral objectives and the learning of basic cognitive concepts and skills. Then, as the student makes mistakes in applying these concepts or skills as behaviors, additional information is brought in as needed. Thus, the functional context principle of meeting students needs when they have needs can be utilized. Further, "guided" discovery lends itself to a student-centered learning orientation.

Mager and McCann (1961) tried a similar instructional format with newly graduated and newly hired engineers who were required to learn essential information about their new organization. With only behaviorally-stated training objectives and a list of resources available, a group of six "trainees" was able to complete their training in one-third (1/3) the time of previous "trainee" instruction. Furthermore, they displayed more confidence and were able to work with less direct supervision than previous "trainees".

It would be an ideal learning environment if a student could control the rate of his information acquisition, structure the information to fit his particular background, and obtain additional information on demand. An experiment

to test such an instructional design proved that learning is increased, but only if the student has had past experience and success in making inquiry and solving problems on his own (Fry, 1972). Until computers are built which can respond as described, however, requirements for efficient, complete or effective student-control or "discovery" cannot be met, even for information acquisition. Further, since soft-skills involve processes or behavioral skills which require application within group settings, group feedback or "guidance" remains an essential ingredient in the instructional design.

3. Acquisition of Information Needs To Be Made Easier. Several students saw the present information acquisition system as inefficient in terms of effort and time. (NOTE: Army manuals were judged difficult to read.) Thus, there is a need to develop short, on-the-shelf, learning materials, preferably self-instructional in design, so that students who are weak in certain areas can pick up necessary skills and techniques when they need them--quickly, efficiently, and on their own. Such modular-packaged programs should include specific behavioral objectives and performance criteria. The learning center concept is appropriate here. Since they would be in support of primary learning goals, their number and content should be based strictly on student needs.

Nonetheless, peer instruction remains a valuable means of utilizing the resources available within each group of students. Only when students exhaust their own resources, should self-instructional materials be prepared or used. This, of course, requires repeated faculty testing, sensitivity, and responsiveness to student needs instead of what is convenient for administrative purposes.

The Chemical School faculty responded to their student's needs by designing realistic and relevant problem situations. Now they need to listen for what is needed to make learning more efficient and at the same time allow the student to learn skills, processes, or techniques which are superior to those which they bring to school or to those known by their instructors.

4. Additional Process-Based Job Functions Need To Be Integrated Into Existing Training Goals. For example, behavioral process skills for dealing with subordinates are beyond the scope of the course as it presently exists. Other schools, especially, need to train their students in such areas as performance counseling, motivation, and leadership.

A problem-solving instructional framework is especially suited to leadership training because effective leadership/management is not only using information; it is applying analytical and behavioral skills, appropriate to the situation, after an analysis has been made. Thus, listening to lectures, reading books,

or solving paper problems with the goal of understanding and accepting new ways of handling "people" problems is not sufficient. Moreover, such inadequate training invariably causes those who attempt to try new approaches of leadership/management to experience failure and frustration. As a consequence, they usually revert to more familiar methods when training concludes. In general, students need more than mere exposure to alternative behavioral skills; they need to practice using them until they can operate outside of narrow stereotyped frameworks.

5. Behavioral Scientists Need To Be Brought Into the Analysis of Job Functions. Recently, through much research and development, behavioral scientists in industrial and organizational settings have discovered and derived new processes and behavioral techniques which have great usefulness for Army leaders. Are we going to have students learn how to use the best known state-of-the-art techniques or are we expecting them to not only invent the wheel but also discover the latest and best tire to go on it?

If CONARC schools do not make use of behavioral scientists, too much value is placed on individual instructors' past personal experiences or their hypotheses of how best to cope with problems they haven't experienced. In our experience the best available behavioral techniques rarely are used by job incumbents, let alone by instructors. Further, if instructors (consultants) do not exhibit the best known behavioral skills, they not only serve as poor models, they may reinforce counter-productive behaviors as well.

It follows that behavioral skills, processes, or job functions which lie outside the range of existing faculty experience or training require expert analysis. Behavioral scientists appear to be best able to analyse officers' job requirements to identify problem areas and then determine appropriate job-tested behavioral techniques which will enable graduates to effectively handle them.

6. Students and Instructors Need To Be Trained To Use a Problem-Solving Framework. Chemical School students were confronted with a learning environment that required skills unlike those useful in passing college courses. Thus, "shock" occurred for some. It took time and understanding for some students to learn what to expect and what was expected of them. The excessive degree of "freedom" and ambiguity inherent in problem-solving caused some students, who had been successful in "parroting back" information in the past, now to "fail".

Specification of behavioral objectives will greatly reduce ambiguity, but the requirement to take initiative in solving problems where uncertainty exists, demands special, systematic, training to overcome prior conditioning (Campbell, 1964; Dunbar and Dutton, 1972; Fry, 1972). Likewise, instructors

need training for conversion from traditional roles into consultants or facilitators of learning. The Chaplain School C-22 Course, in fact, begins with a special five-day workshop to develop students and faculty into effective learning teams.

7. Administrators Need Training In Organizational Development (OD) Skills. In the beginning, LTC Roark and his associates re-designed the C-22 Course their way. But they had difficulty in selling it to faculty; in fact, they were lucky to have been able to overcome resistance to their changes. If other schools wish to implement similar changes, curriculum designers and administrators need to know how to initiate change and how to develop and adapt their organization to the needs of students and the changing environment. Organizational development is the name for total-system, planned-change, processes that increase organizational effectiveness to the point where self-renewing practices become SOP (Beckhard, 1969; Gardner, 1964; Schein, 1972).

Thus, organizational development techniques, which include problem-solving skills, not only aid in initiating change and setting goals, they also aid in maintaining an instructional system that is responsive to both the real world and students' needs. Although systems engineering of training procedures are supposed to accomplish similar goals, nowhere in the regulations are mention of the necessary processes. That the Chemical School designers have already undertaken steps to avoid hardening of the arteries or inbreeding of ideas shows the need for self-renewal. Encouraging students to challenge the instructional methods, content, and goals or rotating staff personnel has become their main means of self-renewal. Nonetheless, other methods are possible and probably will be needed as time will bring new administrators and others who will challenge the existing system. Reactionary change could replace planned change unless the benefits of a problem-solving format can be experienced by newcomers within a management system which is itself problem-solving and continually self-renewing.

CONCLUSION

We have outlined an approach toward implementing soft-skill training in CONARC schools, specifically C-22 courses. At this point, the instructional model is fairly well conceptualized and a testing out phase has begun. Further development and testing should soon provide sufficient experience and feed-back to generate specific procedures and processes which will enable CONARC schools to adopt and implement a similar instructional format. Constraints imposed by practical reality will no doubt play a part in the final design at each school.

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APPENDIX A

A Look Into the Future

Now that you've had a chance to help us define what *"soft-skill"* jobs are or are not, we'd like your reaction to our general conception of how they should be taught.

Basically, we feel that acquisition of most of the knowledges and skills of *"soft-skill"* courses must involve the active participation and involvement of the learner. Furthermore, for such knowledges or skills to be transferable, they must be used by the learner in the active solving of training problems very similar to those found on-the-job in real-life military assignments. As such, the instructor is not concerned with providing answers or solutions to the learner but rather with providing him with a variety of simulated *"emergent"* situations. There, the learner can experiment with new techniques, make mistakes, and learn from them (receive immediate feedback) without fear of embarrassment or fear of evaluation.

Furthermore, we feel that basic concepts and principles can be learned effectively by individualized, self-paced methods. Since learning objectives (including actions, conditions and criteria) will be stated in behavioral terms, the learner will know when he has sufficiently mastered _hem. Thus, before he attempts to apply them to simulated situations, he will be required to be at least cognitively knowledgeable in the basics.

Next, small groups of learners are formed, each with an instructor or learning facilitator. His job function will be to provide essential resources and guarantee a non-threatening environment, one removed from disruption and undue observation. Class time is devoted to repeated practice of knowledges and skills in simulated situations. Peer evaluation is the primary means of feedback and is immediate, accurate, and corrective in nature.

For example, assume you were about to design a POI to teach combined arms doctrine in the Advanced Course (say Air Defense doctrine to Infantry types). Why not have students learn the information from the point of view (perspective) of one who has just taken command of an appropriate unit where the knowledges and skills of Air Defense doctrine are needed to solve a military problem? Thus, instead of having to memorize a list of concepts, the student would only be required to know where they are located (perhaps best in a condensed version of FMs) and be able to use them in solving realistic problems.

Obviously, as change occurs or as time passes, memorized facts have a very short life span--but having to solve problems in school by use of concepts or principles is not only far more meaningful to the learner but

also more transferable to future job assignments, especially where the officer will encounter unique or novel situations not now anticipated.

Of course, such terminal tasks can be very complex and difficult. Therefore, a hierarchically arranged series of less difficult learning steps are required before final terminal objectives are attempted. In addition, modification and updating of simulation situations to reflect change would be built into the instructional design.

Before reacting to these ideas, please read the following definition of simulation.

Simulation

Simulation is a technique for modeling real-life complex situations. By the actual practice of new modes of responding to stimuli which are highly similar to real-life situations, simulation exercises are most effective in extinguishing old, inappropriate responses and establishing new, appropriate responses. This is especially true when "knowing *what* to do, and *how* to do" is not equivalent to "being *able* to do".

To insure maximum transfer of learned skills to real-life situations, training situations should be complex, ambiguous, and *emergent*, so that, as in real life, they require the trainee to sort out the important facts from the confusion of events surrounding him and to identify the essence of a problem as it arises. For example, one of the more important skills a leader must develop in order to be effective is to be able to recognize when a problem exists and to be able to identify it correctly.

Furthermore, simulation enables the learner to practice in a large variety of critical situations in a short time. Thus, he can reach established criteria relatively quickly. In addition, simulation produces considerable involvement and motivation on the part of participants; a condition considered necessary for higher level type learning to occur. Simulation is also well suited to role-playing, another method of obtaining learner involvement and concern. Finally, self-evaluation by trainees of their performance can be easily encouraged, especially through comparison with responses of other participants.

In general, initial simulation exercises should be simple, i.e., with clear-cut solutions and permitting direct application of concepts and principles. Later, as success builds confidence and skills increase, more difficult simulation exercises can be tried. When to introduce them is subjective, it depends on student learning rate and training time limitations. The goal is to facilitate the transfer of learned principles and skills to real-life problem situations with minimum effort and maximum confidence.

Basic reactions by 35 respondents to the question: *What do you think about the above approach to training in the soft-skill area?*

- Sound approach.... We are forecasting essentially the same approach...FY 73.   Agree with the approach.... We hope to include much more individual and small group work in our advanced course.   This approach is presently being tested on a trial basis....   [Six respondents indicated this approach or similar approach is presently being used or planned.]

- valuable

- definite application

- sounds good

- very effective

- In the soft-skill area, we believe that a maximum exposure to ambiguity and uncertainty provides a maximum gain in training.

- I very much like the approach and rationale.... This work should have been started five years ago!

- Excellent

- There is no doubt that simulation, as defined, has a prominent place in the 'soft-skill' area.

- I like it very much and we have gone in this direction.

- I think it would be a 100% improvement!

- Excellent! I favor simulation, but above all, I support hands-on training, i.e., using manual, regulations, etc. Not memorizing a 'laundry list'. Your ideas are great!

- The fact that something is different about the kinds of skills or performance factors required in any field of endeavor suggests that better ways and means to identify, structure, and organize such data must be developed.

- It is most welcome to see an effort, the results of which will assist in the systematic design of courses in the 'soft-skills' area.

- ...an ideal approach to soft-skill education....

- Appears to be a reasonable approach.

- Generally very appropriate....

- Your analysis is correct.

- This appears to be a realistic approach.

- I heartily support your effort in this area.

- I think the above approach is realistic and a definite improvement over simply memorizing concepts, principles, etc.

- Interesting....

Reservations expressed by 35 respondents ~he question: *What do you
think about the above approach to training in ~~ soft-skill area?*

- Where will we get sufficient training time?

- More experienced instructors will be required:
    a. Authoritarians can't handle change from teacher- to
        student- centered instruction--'bull sessions' will
        appear to be a waste of time.
    b. Extensive training of instructors is required, but
        where will we get sufficient training time?
    c. The number of small group 'facilitators' required is
        a luxury that most schools cannot afford, especially
        with manpower restrictions.
    d. Success depends on quality of the instructor or
        learning facilitator, thus instructor selection
        becomes a problem.

- Overuse of one method is a possible consequence.

- Army simulation, at present, is not <u>emergent</u> (ambiguous/uncertain)....
  Simulation 'samples' of real-life are often applied 'verbatim' by
  young officers to real-life problems.

- When documentation, doctrine and job standards are weak--simulation
  presents problems.

- ...this approach must be used in conjunction with field observa-
  tion in order to be effective.

- The solving of many small problems is not always tantamount to
  solving larger, more complex ones.

- The evaluation procedure remains highly subjective:
    a. Can a simulation be both sufficiently controlled for
        answers so that evaluation is valid, yet offer the
        range of variables even approaching that of real-life
        battlefield problems?
    b. Peer evaluation is 'blind leading the blind'--should
        also use superiors or subordinates as in real-life
        situations.
    c. Too many variables in situations addressed, thus
        quantitative measures will probably be fruitless
        and/or meaningless.

- Numerous 'hard skills' are embedded within what we are now
  referring to as 'soft-skill' courses. One must know <u>both</u>
  how to design a bridge <u>and</u> how to organize and supervise his
  resources to construct that bridge.

- While not denying the validity of self-paced methods, there is
  a point at which caution needs to be exercised in prescribing
  conceptual data as a prerequisite of group work. If conceptual
  material is reserved for a time before the group is formed, as
  seems implied in the survey, the group loses a primary vehicle
  for developing inter-personal skills and for internalizing the

true foundation of the skills they must ply. I believe it is
especially true of concepts that they become meaningful and
useful when they have been 'discovered' in the process of 'doing'
something rather than in reading about them. Thus they become
more than ideas, but the basis upon which actions are taken, and, as
far as is possible, should be dealt with in a group where ideas can
be processed, bounced off others, tried out, and finally 'discovered'
as essential to effective performance of a task. In this process,
interpersonal skills grow.

Secondly, if the use of groups as learning teams becomes the
media through which learning happens, as is implied, the course
designer must be very careful about what material is prescribed as
individualized/self-paced instruction to be accomplished outside
the group. One of the strengths of using a group as a learning team
is that the cumulative cognitive knowledge of the total group is
always superior to the knowledge of any single individual in the
group (and frequently of the instructor as well). To prescribe
cognitive data to be learned outside the group may rob the instruction
of a significant resource--the group as instructor. Though it is
true that at times the situation may dictate that involving several
students in individualized study is more efficient than requiring
the whole group to deal with it on a basic level, there are trade-
offs which must be considered in making the choice.

1) As the group assumes responsibility for teaching ALL its
members, interpersonal skills are developed which are much more
significant than the time spent in bringing the less knowledgeable
student up to their level.

2) As the group teaches data, no matter how basic, it learns
the data in greater depth.

Finally, data learned in preparation for an 'emergency' situation
may be data which must be re-learned. It goes without saying
that the most efficient way for cognitive information to be learned
and retained is to introduce it at the point of need. As much as
is possible, the learning situation should dictate at what point
cognitive data is needed and introduced. To prescribe it as a
prerequisite to a task objective may be to put it at a point least
useful to the student. As far as is possible, the practice of prescibing
cognitive data as a prerequisite to a training/learning objective
should be minimized.

On another, but related topic, the concept of training objectives
in Systems Engineering must be addressed. Systems Engineering seems
to have been developed to respond best to hard skills. Thus, the
concentration on 'tasks' is appropriate. In the soft-skill area, the
concentration on 'tasks' seems superfluous and superficial. Particu-
larly in the C-22 program (Officer Carrer Course), the specific tasks
are vague. Those tasks which can be defined and measured very precisely
are usually the least significant and could as easily be learned in
OJT. Much more significant are tasks belonging to the affective
domaine and impacting on his attitudinal environment. These tasks
defy definition except in such vague terms as 'supervise,' 'manage,'

etc., and are hardly the kind of tasks for which precise criteria or standards can be established. It is _ _ opinion that the concept of tasks as embraced in system engineeri... must be modified by incorporating attitudinal criteria. Thus, at least for C-22 students, the question which systems engineering must ask is not, 'What does the student need to be able to do,' but, 'What kind of a person are we trying to develop?'. Both curriculum development and methodology must converge on this modification if we are to produce someone to 'manage,' 'supervise,' etc., with any degree of sensitivity and effectiveness.

Answers by 35 respondents to the question: *What other approaches do you recommend or feel that are important for this purpose?*

- Certainly all methods and media should be considered lest we go as far in this direction as we were during the teacher-centered area.

- Lectures, conferences, case studies, seminars, panels, programmed instruction--all have their place. The objective is paramount. Schools should use methods that will, for them, best achieve the objective.

- Use the following approaches: case method (real problem presented to students for a decision); In-Basket (several mini-problems are given to students for a decision); Role-Playing; Debates; Practical Exercises; Mini-Teaching (e.g., briefings, and teaching and critiques).

- Focus on broad job functions.

- Instead of 'tasks' use subject areas (i.e., personnel management, military justice, training management, etc.) to obtain a consensus of opinion on the need for instruction in each area, then use the experience and expertise of the appropriate school staff and faculty to determine the subject area scope.

- Have students devise individual solutions to a series of realistic field problems in the absence of totally adequate resources and/or time. A similar technique could be employed with student groups, as appropriate.

- Emphasize face-to-face discussions with graduates in the field to determine their needs and what is expected of them. Continue with self-tutor, self-paced and Let's go Modern! Use casettes, tapes, film as modern civilian schools are using.

- Employ student-centered, performance-related training.

- Develop some situational performance tests, oriented to what the officer would do on the job and present them to the student in as close to the 'job environment' as you can make it.

- In many instances, due to limited resources, it is possible for the student to be put in 'planning' situations requiring students to prepare a plan for execution of some defined objective in which limitations are imposed on the range of his decision-making and limited resources made available for allocation.

- For soft-skill courses such as leadership courses, it is very important to design the task inventories carefully. They need to be sequentially arranged from the visualized start of an operation or job requirement for an expected job situation through to completion of the job requirement. Systematic breakdown of tasks are important. It's better to be in too much detail than not enough. Later summarizations can be made as necessary.

- Another possibility (which should not be used to excess) is learning by exception; i.e., attempting to perform the function without any previous instruction on basic principles or procedures. This is followed by a critique which brings out suggestions for improvement and/or points out actions committed or omitted which were detrimental to procedure, or technique which surpasses the 'school solution'. If not, the 'school solution' can always be contrasted with his, showing the rational which supports the 'school solution'.

- The Group Process Plan (Indiana Plan) of the USA Chaplain School.

FACT SHEET

THE REDESIGNED CHEMICAL OFFICER ADVANCED COURSE

Beginning with the class opening in September 1971, the Chemical Officer
Advanced Course has undergone significant change. The course is now de-
signed to encourage maximum student participation, response, and growth
by helping him to learn to cope with realistic and relevant situations
in an atmosphere that allows optimum latitude for the exercise of
initiative. To prepare the graduate for continuing growth, much greater
emphasis has been placed on the fundamentals: the communicative; human
relations; quantitative/computational; and conceptual/problem solving
skills.

The curriculum includes the essential professional and technical knowledge,
that is: principles, doctrine, concepts, techniques, and procedures.
What has changed is the orientation of the course, the curriculum, and
the faculty. No longer is the instruction theory - and instructor-
centered. It is now learning- and student-centered. The philosophy
that fostered the selection and teaching of material it was assumed the
student needed to know, followed by practical exercises that directed
the student toward narrow, almost specified, solutions, with little or
no margin for error, has been done away with. It has been replaced with
a philosophy that requires the faculty to respond to the student's real
needs by finding, or designing, realistic, relevant situations that the
student can imagine himself facing in the real world. The faculty gives
the student only the minimal instruction that is pertinent to the
situation. Great dependence is placed on the student identifying the
problems inherent in the situations through his own participation and
activity, learning by doing, individual effort, peer instruction, and
self pacing. What might be called the "whole-school concept" is employed.
The student calls upon the faculty, classmates, library, staff and support
activities (to include the Post staff and facilities), and whatever out-
side sources he may need. He is given time and reason to use them. The
lecture and conference are rare (except for certain specific technical
subjects such as Prefix 5); the seminar is more common, but is kept to
a minimum. Attendance at these is voluntary.

The vehicles used are the various command levels of the Army: company/
battalion, brigade, division, installation (CONUS Base) and higher head-
quarters (to include high level logistics). These levels (at each of
which the class spends 5-6 consecutive weeks) allow a design of the
learning process which progresses from attacking relatively simple
specified problems to more highly complex situations requiring identi-
fication of problems, followed by analysis and development of workable
solutions. It should be understood that these levels are merely vehicles
in the learning process and are not designed to emphasize the organiza-
tions selected. They provide a device for integrating learning in a

logical progression, while at the same time illustrating problems and procedures similar to those that may be encountered in later assignments. Realism and relevance depend on the careful selection of problems and situations. As far as practicable these have been extracted from current records, documents, and files. Some of the actual reply or response documents are available. School solutions have for the most part been eliminated in that the overriding objective is not a solution, per se, but the development of the student's ability to cope with problems and arrive at logical, sound approaches to solutions, recommendations, or decisions.

The class is organized into small work groups, membership of which is changed at each level. The class meets as a whole only occasionally for common instruction. A faculty consultant (normally an experienced major) is available to each group at all times to answer questions, provide guidance, closely observe individual and group action and inter-action, and provide evaluations of the students.

Student evaluation is, for the most part, subjective, based on per-formance. The student is rated on what he can do, and how well he does it, not on what he knows as determined by objective recall or recognition tests. Performance inthe course is based on written and oral presenta-tion of solutions and the work, logic, and breadth and depth of overall understanding that has gone into these solutions. The system is essentially macro-evaluation as opposed to the micro-evaluation common to objective-type evaluations. Students are scored on a pass-fail basis for each performance with provision for recognition of distinguished performance.

GRADUATE PROFILE

THE CHEMICAL OFFICER ADVANCED COURSE GRADUATE MUST BE:

1. PROFICIENT IN TECHNICAL ASPECTS AND APPLICATIONS OF CBR.

2. ABLE TO IDENTIFY AND ANALYZE COMPLEX PROBLEMS.

3. ABLE TO THINK IMAGINATIVELY AND IN THE BROADEST RANGE POSSIBLE.

4. CONSCIOUS OF THE ISSUES AND PROBLEMS OF THE ARMY AND SOCIETY.

5. SKILLED IN INTERPERSONAL RELATIONS.

6. RELAXED IN THE PRESENCE OF HIGH-RANKING OFFICERS AND OFFICIALS.

7. ABLE TO DEMONSTRATE HIGH PERSUASIVE ABILITIES.

8. ABLE TO COMMUNICATE EFFECTIVELY-- ABLE TO WRITE AND SPEAK IN SUCH A WAY AS TO PRESENT COMPLEX ISSUES CLEARLY.

9. FAMILIAR WITH PROBLEMS AND PROCEDURES AT VARIOUS COMMAND LEVELS.

DR. MILTON H. MAIER

D . Maier is currently assigned as Project Director for Research on Enlisted Training and Classification, U. S. Army Research Institute for the Behavioral and Social Sciences.

He received the PhD in psychology from Purdue University in 1959. After a period with Army personnel research, he joined Educational Testing Service, Princeton, New Jersey, and remained until 1965. While with Educational Testing Service he conducted research on the development and evaluation of self-instructional programs. His work there resulted in several reports and a book entitled, A Guide to Evaluating Self-Instructional Programs.

Since joining the Army Research Institute, he has been primarily responsible for developing the new Army Classification Battery and aptitude area system, which is scheduled for operational use early in 1973. He has conducted research on the effects of educational level on the validity of the Army Classification Battery and on the effectiveness of Army classification tests for blacks and whites. In the future, Dr. Maier will assume greater responsibility for individual MOS training in addition to his work on classification testing.

AN IMPROVED ARMY CLASSIFICATION BATTERY

Milton H. Maier
U. S. Army Research Institute

Each of the armed services is faced with the problem of selecting, classifying, and assigning to training and jobs large number of young men who enter the service. Most of the men have limited work experience and little technical training; thus little information is readily available about the jobs they can best fill while on active duty. Selection and classification tests have been developed and used over the years to measure the potential of the young men to perform in the large variety of jobs open to recruits. In the Army the number is several hundred jobs. The tests are an efficient and accurate means of assessing the potential to succeed in each of the jobs or associated training courses, and permit an effective match between the needs of the service and the capabilities of the new recruits.

The Army Classification Battery (ACB) has been used for over 20 years in assigning men to their job training courses. As the Army moves from an induction input to an all volunteer input, the ACB will be used increasingly to help make selection decisions as well. In the various enlistment options available, mental standards are set in terms of the Armed Forces Qualification Test (AFQT) and aptitude area scores, derived from the ACB or its counterpart, the Army Qualification Battery (AQB). Using the test battery for selection imposes somewhat different requirements than using it only for classification. If the tests were used only for classification and assignment, then the differences between the aptitude scores would be the critical factor. We would want to know if the man had more potential as, say, a mechanic or clerk; but because he already has been selected into the service on the basis of another test, such as the AFQT, we would assume that he is at least minimally qualified in both areas. If the test battery is used for both selection and classification, then we want to know not only the differences in potential, but also whether he is mentally qualified in the different areas.

The distinction between selection and classification was brought home forcibly to the Army when the mental standards were lowered for Project 100, 000 in 1966. Up until that time all the input had the minimal levels of literacy and general mental ability because the mental standards were high. The aptitude area scores obtained from the ACB were used to

reveal the job areas in which the men could be best utilized. Men could be assigned to the difference areas on the basis of their aptitude area scores with reasonable confidence that they would perform satisfactorily.

When selection standards were lowered to accept men with lower mental ability, the level of general ability was changed sufficiently to create problem. Some Army schools were receiving too many men who could not absorb the highly technical material because they were too low on general ability. We developed an interim solution to make the aptitude area scores more suitable with the new levels of input, but it was not implemented operationally because of the manpower implications. We were developing a new classification battery at the time, which is expected to be ready for operational use early in 1973. The aptitude area scores obtained from the new ACB are more suitable for the dual purpose of selection and classification.

One need for a new system to select and classify Army enlisted men became apparent with the lowering of mental standards. Another need for a modification of the test battery arose from the passage of time and the associated changes in our culture and the Army training courses. Some of the test items date back to the 1950's, and some of these seem out of place today. For example, the German general, Rommel, The Desert Fox, no longer receives much popular attention, and television picture tubes have changed design as compared to 20 years ago. In addition, the Army technology has changed with more sophisticated equipment. The training requirements have been increased to enable the men to cope with the more technical machines and concepts.

Starting over a decade ago, we began an extensive research program to develop a new version of the ACB. The research objectives were to update the tests that were becoming obsolescent, to find content more suitable to the newer types of job training courses and to find new kinds of tests that would increase the predictive accuracy of the battery.

The research program was successful in that a new version was developed which does meet more effectively the needs of the modern Army. The relationship between the tests in the old and new ACB is shown in Table 1.

TABLE 1

CONTENT OF NEW AND PRIOR ARMY CLASSIFICATION BATTERIES

NEW ACB		OLD ACB		CHANGE
GENERAL ABILITY TESTS				
ARITHMETIC REASONING	(AR)	ARITHMETIC REASONING	(AR)	SHORTENED
WORD KNOWLEDGE	(WK)	VERBAL	(VE)	SHORTENED
GENERAL INFORMATION	(GI)	GENERAL INFORMATION	(GIT)	UPDATED AND SHORTENED
MATHEMATICS KNOWLEDGE	(MK)			ADDED
SCIENCE KNOWLEDGE	(SK)			ADDED
MECHANICAL ABILITY TESTS				
ELECTRONICS INFORMATION	(EI)	ELECTRONICS INFORMATION	(ELI)	UPDATED
MECHANICAL COMPREHENSION	(MC)	MECHANICAL APTITUDE	(MA)	UPDATED
AUTOMOTIVE INFORMATION	(AI)	AUTOMOTIVE INFORMATION	(AI)	SHORTENED
TRADE INFORMATION	(TI)			ADDED
		SHOP MECHANICS	(SM)	DROPPED
PERCEPTUAL ABILITY TESTS				
PATTERN ANALYSIS	(PA)	PATTERN ANALYSIS	(PA)	UPDATED
AUDITORY PERCEPTION	(AP)	ARMY RADIO CODE APTITUDE	(ARC)	NONE
		ARMY CLERICAL SPEED	(ACS)	DROPPED
ATTENTION TO DETAIL	(AD)			ADDED
INTEREST TESTS				
COMBAT SCALE	(CC)	CLASSIFICATION INVENTORY	(CI)	UPDATED AND SHORTENED
ATTENTIVENESS SCALE	(CA)			ADDED
ELECTRONICS SCALE	(CE)			ADDED
MAINTENANCE SCALE	(CM)			

The New Army Classification Battery

General Ability Tests. The new ACB has five tests of general
ability, three common to the new and previous battery, and two
added tests, Mathematics Knowledge and Science Knowledge. The
Word Knowledge and Arithmetic Reasoning tests are changed from the
original only in having been shortened to provide more efficient mea-
surement. The General Information test, updated and shortened, has
shifted from its function as primarily a combat selector to serve as a
measure of the general ability required of good performers in selected
noncombat MOS as well as in artillery. The Mathematics Knowledge
and Science Knowledge tests were added to expand coverage in this
important aptitude domain. Each of the five tests measures a different
aspect of general ability. The Word Knowledge, Arithmetic Reasoning,
and General Information tests cover skills and knowledge that can be
acquired in or out of school. The other two tests cover abilities taught
in formal school courses. All five tests measure aptitudes required
in a wide variety of jobs and siutations.

Mechanical Ability. Four mechanical ability tests are included in
both batteries. The Automotive Information Test was shortened for the
new battery. The Shop Mechanics Test was dropped and replaced by
Trade Information. Content of the Electronics Information Test was
updated. The Mechanical Aptitude Test was updated and the title changed
to Mechanical Comprehension. The new tests have the advantages that
the content is up to date, the tests are more valid, and all are shorter.

Perceptual ability. The three tests of perceptual ability require
no reading or writing skills but do require ability to perceive certain
kinds of stimuli--geometrical patterns, and auditory and visual symbols.
The new version of the Pattern Analysis Test, which requires visualiza-
tion of three-dimensional form, is shorter than the previous one. The
Army Radio Code Aptitude Test has a new title, Auditory Perception,
but otherwise remains the same. The more inclusive title reflects the
finding that the test is useful for jobs other than radio operator--jobs
that require the ability to listen attentively. The Army Clerical Speed
test was replaced by Attention to Detail, which is more widely useful
and easier to administer.

Self-Description Test. An expanded version of the Classification
Inventory, long used to identify men who will make good combat soldiers,
was introduced. Four separate measures are obtained from this test:
Scale CC corresponds to the previous Classification Inventory score used

to identify combat infantrymen, but it has been updated and shortened. Scale CA is a measure of attentiveness, a useful predictor for a variety of jobs--clerical, artillery, missile crewman, for example. Scale CE (electronics) and Scale CM (maintenance) are related to specific job families; both help identify repairmen who will be successful in the relevant area.

Grouping the MOS

The development of new tests does not by itself result in a new classification system. A critical component is that of grouping the jobs into relatively homogeneous clusters or families. As already mentioned, there are several hundred jobs potentially open to the Army recruit, and some of these jobs are more alike than others. The Army philosophy, with some support from research data, is that the jobs should be grouped into a manageable number of categories, which is in the range of about 8 to 12. The jobs within a group should require similar skills and aptitudes for success, and be as different as possible from the jobs in other families. Thus the electronics repair jobs form one cluster, which is different from the clerical-administrative jobs.

The grouping of the jobs was accomplished by computing the validity of each test for each sample separately. Since we had over 30 tests and 100 samples, there were well over 3000 validity coefficients. We examined the validity profiles for each sample, and grouped those jobs together that tended to require the same aptitudes and interests for success. We had some help in this grouping process from the structure of Army jobs already in existence. We found that with some exceptions we could base our grouping on that used operationally.

The final result of grouping the jobs is shown in Table 2. We ended up with nine MOS groups, shown in the left column; some representative jobs in each group are shown in the right column. Each of these groups was developed on an empirical basis. The MOS were grouped together only if our data showed that they were similar in terms of the interests and aptitudes required for success and different from the MOS in other groups.

The first MOS group, called CO for Combat, includes the infantryman, armor crewman, and combat engineer. The second group, FA for Field Artillery, includes the field cannon and rocket artillery jobs. The third

TABLE 2

REPRESENTATIVE JOBS IN NEW MOS GROUPS

MOS GROUP		REPRESENTATIVE JOBS
COMBAT	(CO)	INFANTRY, ARMOR, COMBAT ENGINEER
FIELD ARTILLERY	(FA)	FIELD CANNON AND ROCKET ARTILLERY
ELECTRONIC REPAIR	(EL)	MISSILES AND AIR DEFENSE REPAIRMEN, TACTICAL ELECTRONIC AND FIXED PLANT COMMUNICATIONS REPAIRMEN
OPERATORS/FOOD	(OF)	MISSILES AND AIR DEFENSE CREWMEN, DRIVER, FOOD SERVICES
SURVEILLANCE/COMMUNICATIONS	(SC)	TARGET ACQUISITION AND COMBAT SURVEILLANCE, AND COMMUNICATION OPERATIONS
MECHANICAL MAINTENANCE	(MM)	MOTOR AND AIRCRAFT MAINTENANCE, RAILWAYS
GENERAL MAINTENANCE	(GM)	CONSTRUCTION, UTILITIES, CHEMICAL, MARINE, PETROLEUM
CLERICAL	(CL)	ADMINISTRATIVE, FINANCE, SUPPLY
SKILLED TECHNICAL	(ST)	MEDICAL, MILITARY POLICE, DATA PROCESSING, AIR CONTROL, TOPOGRAPHY AND PRINTING, INFORMATION AND AUDIO VISUAL

group, EL for Electronics Reparis, includes all electronics and electrical maintenance MOS separate, but out data did not support such a distinction, and we combined them.

The fourth, group, OF for Operators-Food, includes a seemingly diverse collection of jobs: missile crewmen, cooks, and drivers. The grouping emerged from our data, and their common feature seems to be a requirement for a concern with details (reflected by the Attentiveness measure) and ability to handle objects easily (reflected by the Automotive Information test.) The next group, SC, for surveillance and communications, includes radio operators, communication center specialists, and switchboard operators. The MOS involve receiving and processing information; the common element seems to be a requirement for perceptual ability, both auditory and spatial.

There are two maintenance groups, MM for Mechanical Maintenance and GM for general maintenance. The MM group includes motor mechanics, aircraft maintenance and railway jobs. GM covers a variety of jobs, such as construction, utilities, marine, chemical, and petroleum.

The final two groups, CL for clerical and ST for skilled technical, are familiar to Army personnel. CL includes the administrative, finance, and supply jobs. ST is similar to the old GT area, and includes medics, military policemen, and intelligence specialists.

The New Aptitude Area Composites

The final step in developing a new classification system is to find the weights to assign to each test for each MOS group. The weights were obtained by determining which tests contributed most to predicting success in each area. In selecting the tests, we first selected the test that was most valid; then we added the test that made the second largest contribution to validity. We continued the selection process until the remaining tests made little contribution to increasing the accuracy of prediction. Generally we had to select 4 or 5 tests for each MOS before we exhausted the validity of the battery; in two of the areas we needed only three tests. The tests selected for each MOS area were assigned a weight of one; we found through extensive simulation studies on the computer that simple unit weights were as effective as more elaborate weighting schemes. Those tests not selected were assigned a weight of zero. The tests used for the MOS groups are shown in Table 3.

Table 3

NEW APTITUDE AREA COMPOSITES

Test   **Aptitude Area Composites**

General Ability Tests		CO	PA	EL	OP	SC	MM	GM	CL	ST	GT
Arithmetic Reasoning	(AR)	AR	AR	AR		AR		AR	AR	AR	AR
General Information	(GI)		GI		GI						
Mathematics Knowledge	(MK)		MK				MK			MK	
Word Knowledge	(WK)					WK			WK		WK
Science Knowledge	(SK)							SK		SK	
Mechanical Ability Tests											
Trade Information	(TI)	TI		TI			TI				
Electronics Information	(EI)		EI	EI			EI				
Mechanical Comprehension	(MC)			MC			MC		MC		
Automotive Information	(AI)					AI		AI	AI		
Perceptual Ability											
Pattern Analysis	(PA)	PA				PA					
Attention to Detail	(AD)	AD							AD		
Auditory Perception	(AP)					AP					
Self Description											
Combat Scale	(CC)	CC									
Attentiveness Scale	(CA)		CA			CA			CA		
Electronics Scale	(CE)				CE						
Maintenance Scale	(CM)						CM				

Our research showed that the good combat soldier needs general ability, measured by the Arithmetic Reasoning Test, mechanical ability, measured by the Trade Information Test, to handle his weapons and equipment; perceptual ability measured by the Pattern Analysis and Attention to Detail tests, to orient himself in the terrain and observe his environment, and finally, an interest in outdoor masculine activities, coupled with self-confidence, measured by the Combat scale (CC) of the Classification Inventory.

The artilleryman, in comparison was found to require more mathematical ability. Therefore, scores from both the Arithmetic Reasoning Test and the Mathematics Knowledge Test enter into the Field Artillery (FA) Aptitude Area. A further measure of general ability is contributed by the General Information Test. Mechanical ability, measured by the Electronics Information test, and an interest in details, measured by the Attentiveness (CA) scale of the Classification Inventory, complete the picture for the artilleryman.

A similar analysis can be made for each MOS Group. In all cases the tests that were selected for the composites made sense based on what we know about the jobs in each group.

A word should be said about the final composite in the list, the familiar General Technical (GT) Aptitude Area, composed of the Arithmetic Reasoning and Word Knowledge (Verbal) tests. In the old system, the GT score is used both to select men for general technical MOS and to determine which men are eligible to take additional tests such as the Officer Candidate Test. The function of selector for MOS group is shifted to the ST composite. The function of determining eligibility for additional testing continues to be filled by the combination of Arithmetic Reasoning and Word Knowledge Tests. The label GT is retained.

Evaluation of the New Classification System

The new Army classification system was carefully evaluated to estimate how much improvement would be realized over the old system. The conclusions we have reached are that academic attrition in job training courses would be reduced by about 20 percent; that the number of marginal performers, that is, men who barely pass the training course, would be reduced by 20 percent, and that the number of superior performers would increase by 15 percent. The procedures were to run extensive simulation studies on our computer; the details are given in BESRL Technical Research Note 239. In obtaining these estimates

of improvement over the old classification system, the quality of men
coming into the Army was assumed to be exactly the same for both
classification systems. The improvement in performance can be
realiz d because the new system does a better job of getting the right
man into that area where he can perform best.

The new ACB would result in even greater benefit when the improved
selection is considered. Applicants for specific jobs need to qualify on
several aptitude scores. Since the new aptitude scores are more accurate
measures of potential than the old scores, there is greater assurance
than men who meet these requirements can be trained to the point of
acceptable competence in an Army job.

In summary, a new Army Classification Battery has been developed that
will result in improved selection and classification of enlisted men, and it
will be ready for operational use early in 1973. New measures of interest
and general mental ability have been added to the battery, and new com-
binations of tests have been developed to measure more accurately the
potential to perform in training and on the job. The effect of the new
system is to screen out more of the men who would be likely failures
and to utilize more effectively the talents and interests of the men who are
accepted for Army service.

DR. C. O. GRAY

Dr. C. O. Gray, who is currently assigned as Educational Advisor,
U. S. Army Engineer School, is completing his 30th year of service in
the Army Service School System. This period of service has included
enlisted and officer instructor and staff duty, civilian educational staff
specialist assignments, and an extended period as Educational Advisor
at the U. S. Army Ordnance School prior to assuming his current assign-
ment at the U. S. Army Engineer School.

Prior to this lengthy Army Service School tour, Dr. Gray completed five
years as a public school teacher in Pennsylvania and New York.

Dr. Gray's academic preparation includes degrees from New York
University and the University of Maryland. His professional affiliation
includes membership in Phi Delta Kappa, a national honorary educational
fraternity, and the American Society for Engineering Education.

FIELD VISITATION PROGRAM BRIEFING

DR. C. O. GRAY

Educational Advisor, U. S. Army Engineer School

The subject of this briefing is the U. S. Army Engineer School Field Visitation Program (Slide 1). This program is defined (Slide 2) as a programed schedule of visits by a small team of specialists to engineer units worldwide for the purpose of collecting data necessary to give direction to mission efforts and to assess the quality of the school's mission products and services. (Slide off). The specific objectives of this briefing are: (Slide 3)

- To enumerate the feedback needs in an Army service school environment

- To describe the current feedback posture in this environment

- To identify the totality of the USAES field feedback survey system

- To examine the basic elements of this program. (Slide off).

Field feedback in an Army service school environment is fundamental (Slide 4) so as <u>to provide direction for mission output</u> and <u>to provide a means for assessing the quality of mission output</u>. It will be noted that key words to be associated with field feedback are <u>direction</u>, <u>mission</u>, and <u>assessing the quality</u>. (Slide off). To give these terms more meaning and to demonstrate their impact in a viable feedback effort, I would like to review the primary missions of an Army service school, to identify feedback necessary to give direction to these missions, and to address how such feedback can be used in assessing quality.

The six Army service school mission statements dictated by CON Reg 10-4 can be summarized in abbreviated form as follows. (Slide 5)

1. Conduct resident and nonresident training

2. Support ROTC programs

3. Support unit training, including expanded reserve component support.

4. Assist in doctrine development

5. Develop training literature and training aids

6. Disseminate information

Using this mission framework, I would like to identify with each, the contribution of field feedback to <u>direction</u> and <u>quality assessment</u>.

The first mission, (Slide 6) conduct resident and nonresident training, receives through field feedback direction related to --

- The verification and modification of task inventories.

- The receipt of input for the development of job standards.

This direction results in the development and conduct of resident and nonresident programs that produce trained students in job-related skills and knowledges. The use of these skills and knowledges by the trained product on the job is assessed through field feedback by -

- The individual's

- The supervisor's and

- The observer's assessment of adequacy and competency.

The second mission, (Slide 7) support ROTC programs, receives direction through field feedback in basically the same manner as the first mission.

- The verification and modification of task inventories

- The receipt of input for the development of job standards.

Quality assessment of the ROTC program product also relies on field feedback through its

- Individual

- Supervisory and

- Observer assessment of adequacy and competency.

The support of unit training (Slide 8), the third mission, gets direction in its developmental efforts through the following field feedback output

- The verification and modification of unit missions and

- The verification and modification of unit operations.

Assessment of the quality of support through feedback is highlighted by

- The unit commander's

- Key unit personnel and

- Higher command assessment.

The fourth mission (Slide 9), assist in doctrine development, relies upon the direction received through field feedback in a manner equal to if not greater than the previous missions.   The expected feedback direction includes --

- Unit operations assessment

- Operational techniques validity

- Task inventories verification and modification and

- Job standards input.

Quality assessment of doctrine products uses these outputs from field feedback

- The unit commander's and

- The supported elements assessment of adequacy and competency.

Proceeding to the fifth mission, develop training literature and training aids (Slide 10), we can identify the following direction as emanating from field feedback --

- The identification of literature and aids voids

- The users' problems

- The users' characteristics and

- The users' capabilities.

The products of field feedback which contribute to quality assessment associated with this mission are --

- The individual

- Supervisory and

- Observer assessment of adequacy.

The dissemination of information (Slide 11), the sixth mission, finds the school in its role as "Home of the Engineers." The feedback direction needed to fulfill this mission include --

- A forecast of projected demands

- The identification of unit operational problems and

- The identification of most beneficial information modes.

The quality of information furnished can be assessed through field feedback by --

- The individual

- Supervisory and

- Observer assessment of adequacy.   (Slide off)

We believe as a result of reviewing the expected direction and quality assessment output from field feedback that it can be concluded that an Army service school requires the best possible feedback system if it is to achieve its mission with the desired qualitative standards.

The significance and magnitude of the requirements of field feedback in the mission accomplishment of an Army service school as has been discussed demand more than is forthcoming from the conventional field feedback system.   This school currently uses the conventional approach of mailed questionnaires to graduates and immediate supervisors.   The local experience reinforces the thesis that the mailed questionnaire has serious limitations.   Among these limitations (Slide 12) are the difficulty in getting a return of greater than 30%, the coverage restrictions associated with a questionnaire, the stigma associated with such a device by the recipient, and the lack of timely responsiveness which is of prime importance in today's school environment.   In short, our current field feedback effort is not meeting the needs which have been outlined.

As a solution to the inadequacy of our current field feedback effort, we have developed an expanded field feedback survey system which enlarges the scope of the data collection activity, the sum total of which will meet the significant needs for such data. Our total system encompasses (Slide 13) --

- The field visitation program

- Research feedback

- The debriefing of student personnel

- The mailed graduate questionnaire

- The MOS proficiency test data

- The debriefing of assigned personnel

These system components represent, in the main, known feedback sources in a training environment. The one which we have labeled as research feedback requires definition so that it may be understood. Research feedback infers the local usage of feedback data of other service schools having significant blocks of engineer-related instruction in their curriculum. For example, the 13 hours of instruction in the Infantry Officer Advanced Course covering engineer subject matter and taught by engineer officers is of prime interest to the proponent school -- the Engineer School. The analysis of appropriate feedback data from the Infantry School will provide direction for instructional material supporting the engineer instruction at that school.

As previously stated, the major thrust of this briefing is the component identified as the field visitation program, which will be addressed in the remainder of my remarks.

Our proposed field visitation program has 7 objectives. These objectives are: (Slide 14)'

- To initially validate task inventories for all MOS's and duty positions impacting upon the USAES mission and to provide input for the continual maintenance of these task inventories.

- To determine the most cost effective training approaches and environments to meet career development objectives.

- To determine the on-job proficiency of school graduates in the performance of MOS or duty position tasks.

- To assess the learning effectiveness of methods/media used in school courses when measured against job performance.

- To obtain reactions to published training literature for the purpose of improving its utility to the user.

- To obtain user reaction to locally developed unit training programs and to obtain user recommendations that will increase the dynamic quality of unit training.

- To assess the learning effectiveness of the content and approaches used in school correspondence courses when measured against job performance.

Having identified the field visitation program objectives, attention is now focused on three essential elements of the field visitation program (Slide 15). These elements consist of the program sample; The team, its composition and mode of operation; and the data collection devices. (Slide Off).

When the element of the program sample was addressed, the answers to three questions were of prime concern. (Slide 16) Who is to be included in the sample? How large should the sample be? Where is the sample population located?

In response to the first question, "Who should be included in the sample?", the array of MOS's for which the Corps of Engineers has proponency was examined to establish a priority of need. This study identified (Slide 17) 16 resident USAES MOS courses and all 20 ATC courses taught at Fort Leonard Wood for prime consideration. As the sample became more clearly defined an opportunity for gathering data on a more limited scale, but for a far greater array of MOS and courses appeared feasible. By relying on a "questionnaire only" approach, quantitative data needs will be satisfied for the entire range of school proponent courses not included in the base sample. For planning purposes however, the original base of 36 MOS courses (Slide 18) was used for all calculations.

The questions of sample size and geographical location were resolved with the aid of the most recent Army authorization documents system listing. The worldwide distribution of Engineer personnel was screened to identify those units which held the highest concentrations of the base sample of 36 MOS's. Of the several hundred units identified, further screening reduced the list (Slide 19) to its final configuration of 57 units situated in seven major geographical locations. The screening procedures used assured not only the highest concentrations of individual MOS within units but also the highest

concentration of clusters of MOS. Thus any adjustment of the unit list would result in a loss of efficiency in terms of both time and data collection effort. As a result of the screening process, the incumbent population for the 36 MOS's was reduced (Slide 20) from 29,115 to 9,137 enlisted engineers.

This sample of 9,137 will be surveyed by questionnaire in the unit environment with a reduced sample of 2,812 being interviewed. The reduced sample provides for a maximum of 100 per MOS, resulting in a 60% savings of time with only a negligible loss of data.

While not a consideration of sample size, sample quality was improved by insuring that only STRAF units were included in the CONUS portion of the sample.

Of the 57 units constituting the sample 19 different unit types are represented. (Slide off).

The second essential element of the program concept is the visitation team and its mode of operation. After examining the sample size and school resources, it was determined that a single team of 5 members could support the program. The logic underlying this determination is primarily based on the listing of numbers of personnel per unit to be interviewed, and an average interview length of 1/2 hour. These guides were extended to structure the "Team Day." The Team Day is the model for the team's activities during a typical 8 hour workday. Because questionnaire data is to provide the foundation for the followup interview, these had to be administered early in the unit visit accompanied by a unit briefing. It is planned therefore, that the first team day (Slide 21) would be divided into a two hour block of unit briefings and questionnaire administration followed by a six hour block of interviews. All subsequent days within the same unit would consist of 8 hour blocks of interviews. This plan enables the team to work at the rate of 60 interviews for the first day and 80 interviews on subsequent days. Unit briefings are structured to achieve three purposes. They will first open a two-way communication channel between the school and units in the field. The team will be equipped to provide the unit with the most current school publications, plans, concepts, and materials which have been determined desirable by prior arrangement. The forging of this vital link between school and field is considered of prime importance. The second purpose of the unit briefings is to plan the activities of the team during their visitation. With the exception of the questionnaire first, interview second concept, all team activities will follow the wishes of the unit commander. This procedure and the fact that interview schedules have been planned to last no longer than two days are designed to minimize the disruption of unit activities. It is planned that the unit briefings will be attended by key unit personnel. During

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these briefings, data collection devices will be distributed to collect feedback data from the assigned officers and NCO's. The data will be used as the design base of the officer and NCO education system courses. This officer and NCO data collection effort rounds out the third objective of the unit briefings.

In terms of composition (Slide 22) the five man team consists of a LTC Team Chief with either a Combat or Construction Engineering MOS; a Warrant Officer with a maintenance background; and three Noncommissioned Officers with combat engineering, construction engineering and topographic backgrounds. While cross-field interviewing is anticipated because of variations in unit composition, the team backgrounds coupled with pre-visit training should preclude any data collection problems. (Slide off).

The final element of the field visitation program deals with the design of the data collection devices. The wide variety of data needs represented by the program objectives coupled with the sample size and composition creates an imposing data collection and analysis problem. From necessity a modular approach to device design was employed. Five basic modules, each serving a specific set of objectives were devised. These modules would be configured into combinations to serve specific needs. (Slide 23).

The work performance module is designed to provide data for use of task inventory validation, MOS evaluation, and MOS structuring. The format of the task list section of this module is identical to that used by the military occupational data bank questionnaire. This design feature will provide a means for cross-validation and access to the enlisted evaluation data pool. The bulk of the data solicited by the questionnaire is in a form amenable to machine processing. An open-ended section provides leads to be exploited during the follow-up interview sections.

The work proficiency module provides the capability for assessing the quality of USAES graduates and thereby providing insights to the possible need for course modification. Both machine scorable and open-ended sections are provided. This questionnaire is to be completed by the supervisor of the MOS holder.

The literature module is not unique to any specific MOS and thus will be administered to all MOS. The design is directed to collecting data concerning literature usage and user suitability.

The unit training module centers on the collection of information concerned with unit training improvement. This module will be completed by all personnel regardless of MOS. The design of this instrument will supplement and extend data collected earlier, by mail, as part of the Engineer School Dynamic Training Council Questionnaire Survey Program.

The nonresident training module will be completed by only those personnel who have availed themselves of this mode of instruction. The collected data will provide insights to possible course extension and improvement.

By including common identification features in each of the modules, the data, after collection, may be analyzed either in its entirety or separately by the individual requestors. Standardized formating permits maximum machine processing for bulk data while the unstructured open-ended sections permit entries for interview structuring. Modular design also permits data separation by program objectives.

An overview (Slide 24) of the field visitation program illustrates how the components function to accomplish their purpose. This overview addresses the first objective of the program which relates to the validation and maintenance of task inventories. The field visitation program's work performance and work proficiency modules are structured around task inventories. The work performance module is administered to the job holder to determine which tasks he performs and whether he considers the tasks difficult. The follow-up interview would determine the nature and details of any task difficulty. The work proficiency module is structured on duty areas which are groupings of tasks. This module is administered to the job holder's supervisor, and evaluates the competency of the job holder's task performance. Both modules contain a device for matching job holder and supervisor questionnaires. Analysis of the data will determine the percentage of the sample who perform the task, which tasks are considered difficult, the reason for any difficulty, and an evaluation of the proficiency of task performance. The findings would determine the need for school training for a particular task, the adequacy of present training to satisfy field needs, the variance of job performance by unit type or geography, and the impact of time on the job upon task performance. In addition, the findings will provide the answers to many other school mission questions.

This briefing has (Slide 25):

- Enumerated the feedback needs in an Army service school environment

- Described the current feedback posture in this environment

  Identified the totality of the USAES field feedback survey system

  - ribed the objectives of the proposed field visitation program

  - mined the basic elements of the field visitation program (Slide Off).
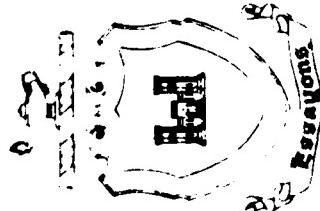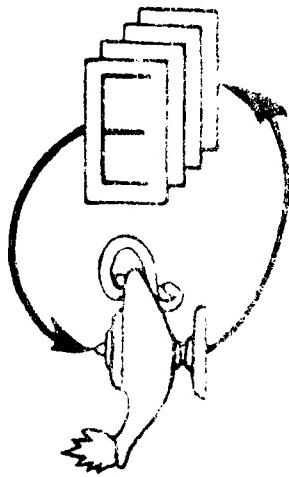
A PROGRAMED SCHEDULE OF VISITS
BY A SMALL TEAM OF SPECIALISTS TO
ENGINEER UNITS WORLD-WIDE TO COLLECT
DATA FOR MISSION DIRECTION AND
MISSION QUALITY ASSESSMENT.
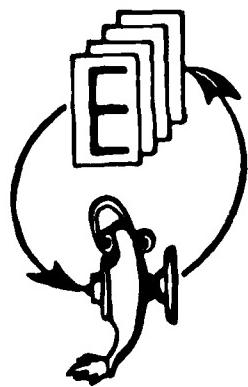
BRIEFING OBJECTIVES
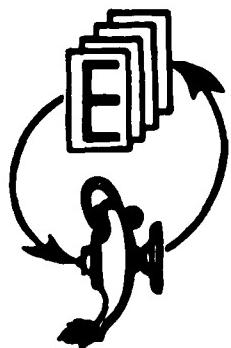
- TO ENUMERATE THE FEEDBACK NEEDS IN AN ARMY SERVICE SCHOOL ENVIRONMENT

- TO DESCRIBE THE CURRENT FEEDBACK POSTURE IN THE ENVIRONMENT

- TO IDENTIFY THE TOTALITY OF THE USAES FIELD FEEDBACK SURVEY SYSTEM

- TO DESCRIBE THE OBJECTIVES OF THE PROPOSED FIELD VISITATION PROGRAM

- TO EXAMINE THE BASIC ELEMENTS OF THE FIELD VISTATION PROGRAM

FIELD FEEDBACK FUNDAMENTALS

PROVIDES DIRECTION FOR MISSION OUTPUT

PROVIDES A MEANS FOR ASSESSING THE QUALITY OF MISSION OUTPUT

V-76
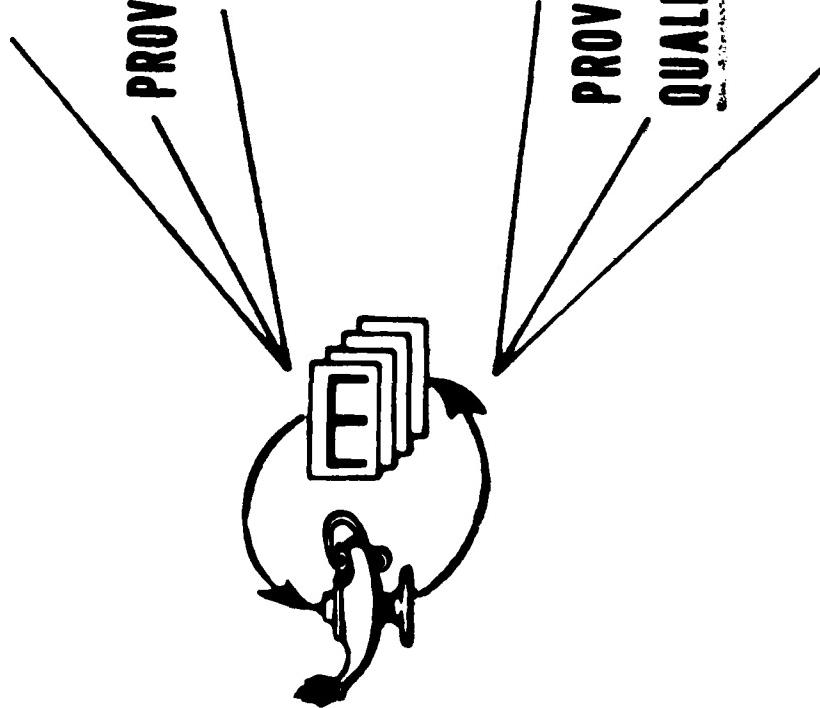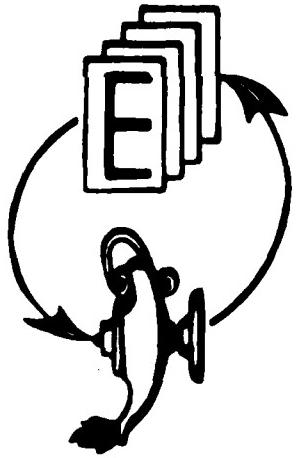
1. CONDUCT RESIDENT AND NONRESIDENT TRAINING

2. SUPPORT ROTC PROGRAM

3. SUPPORT UNIT TRAINING, INCLUDING EXPANDED RESERVE COMPONENT SUPPORT

4. ASSIST IN DOCTRINE DEVELOPMENT

5. DEVELOP TRAINING LITERATURE AND TRAINING AIDS

6. DISSEMINATE INFORMATION
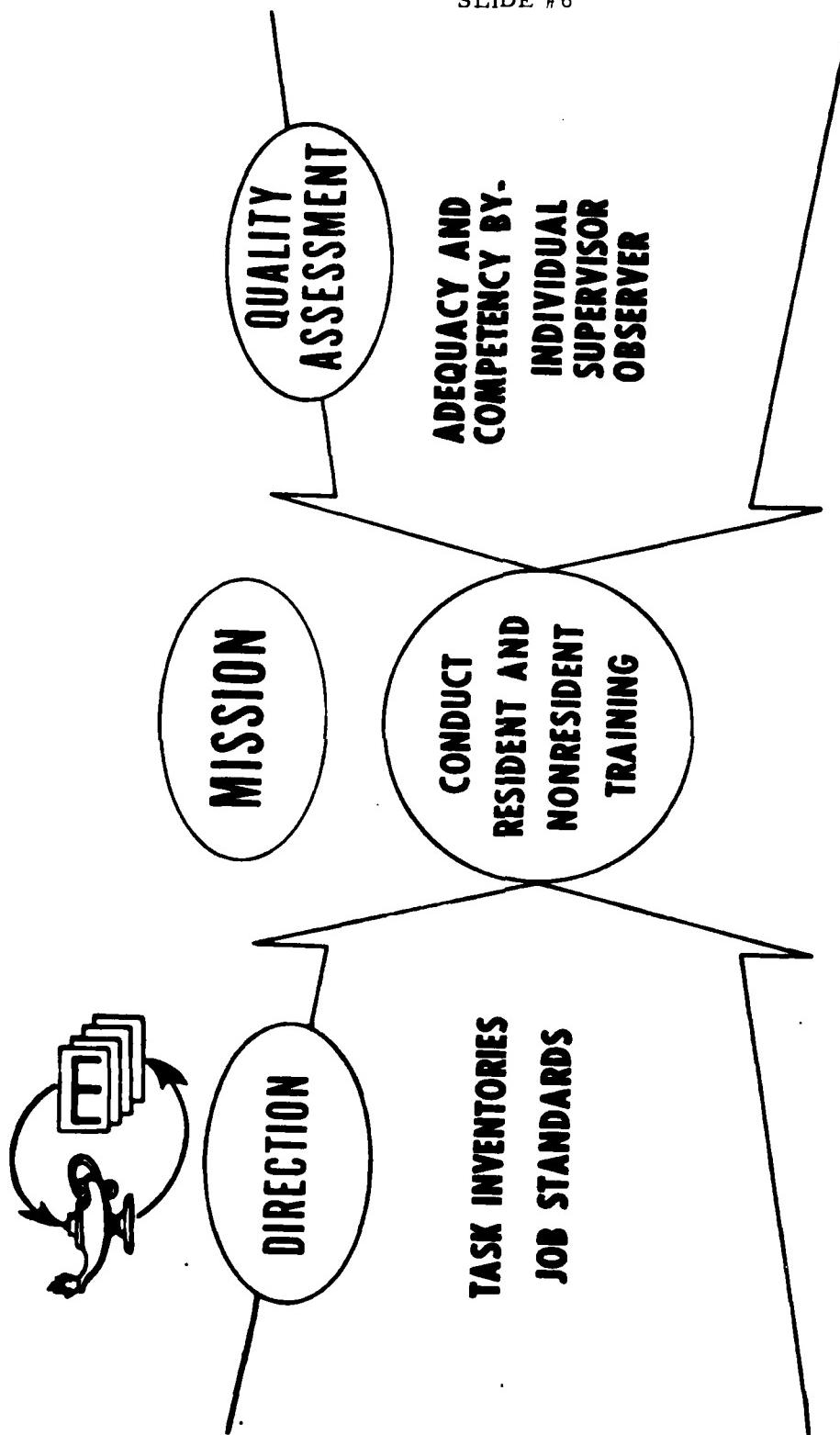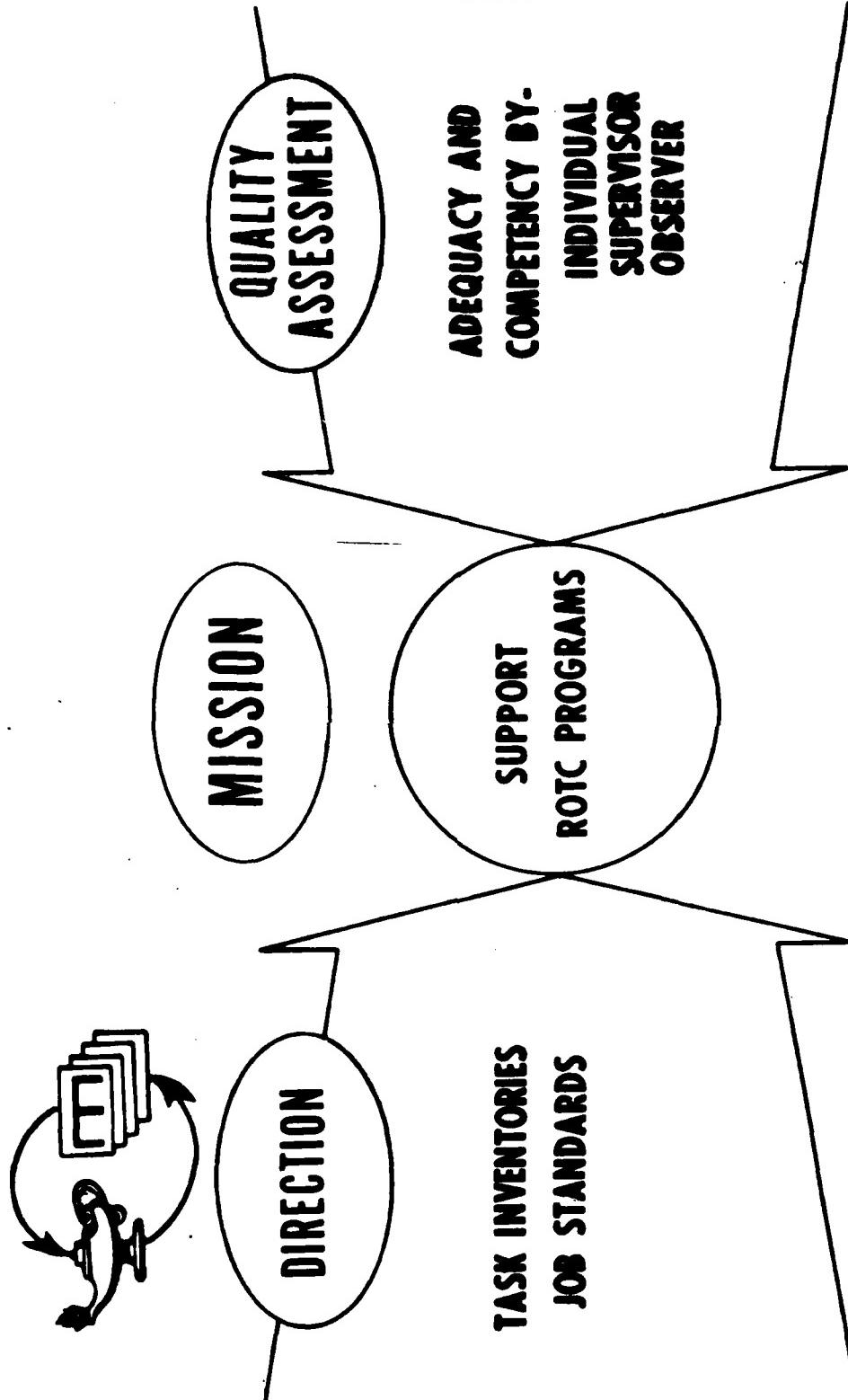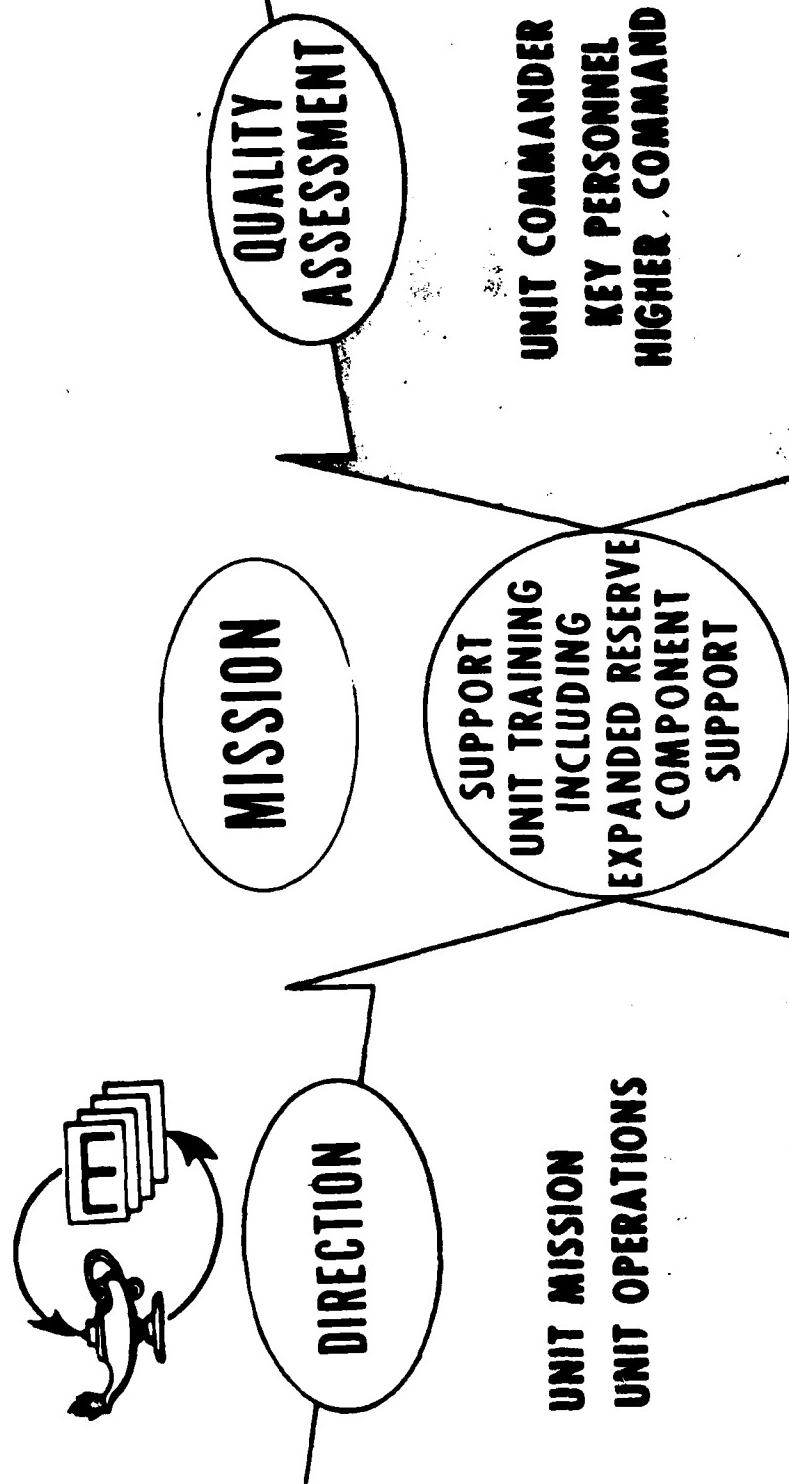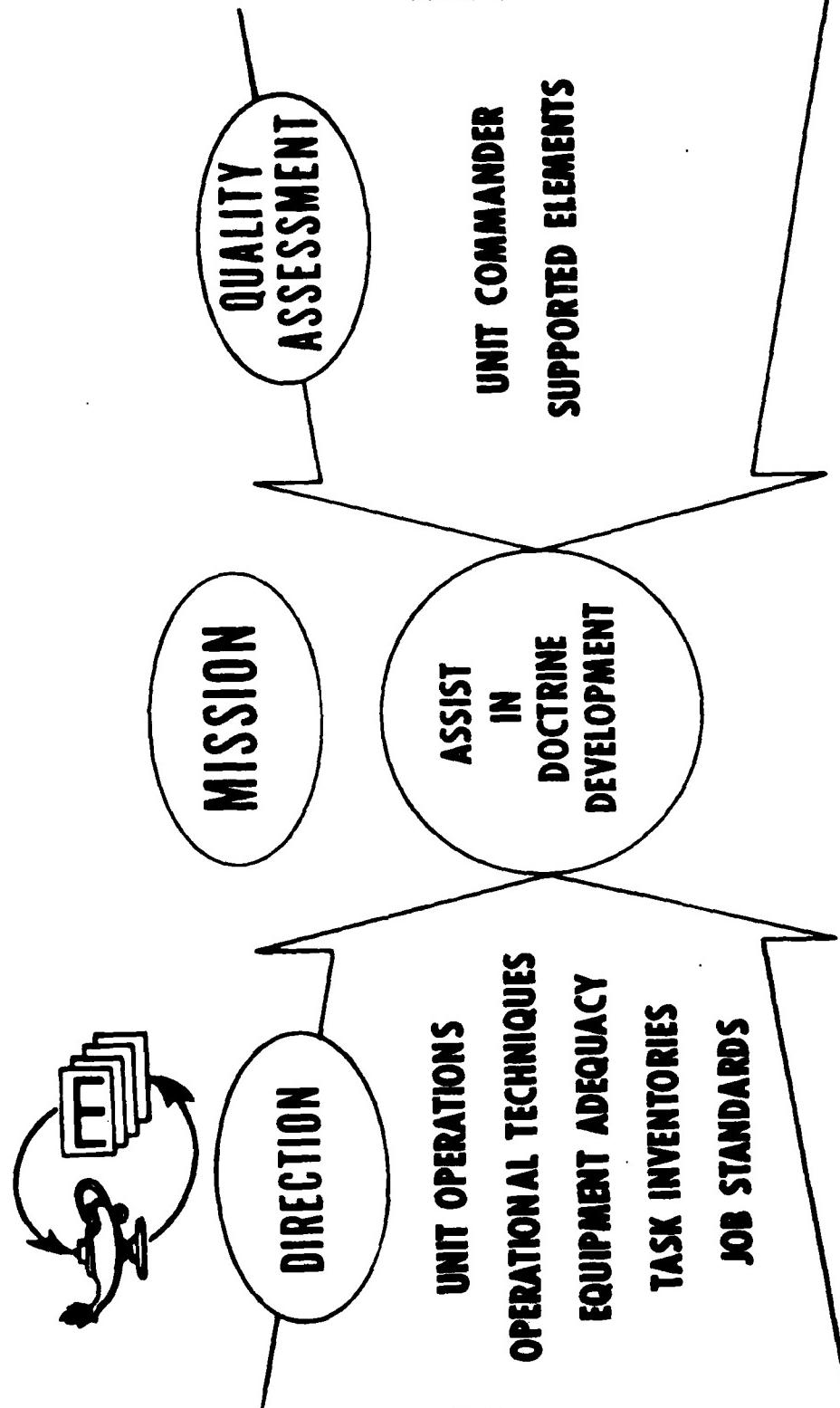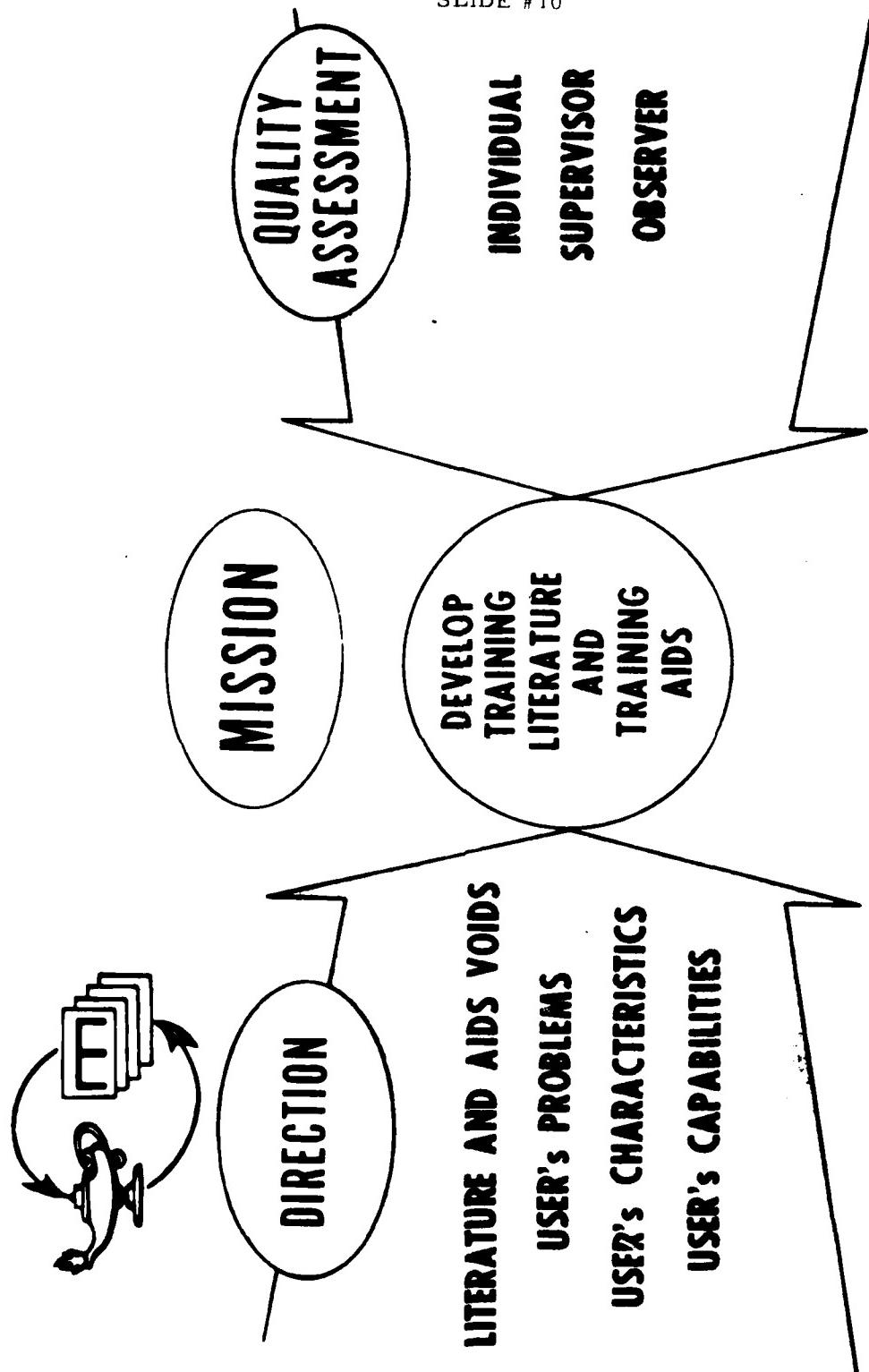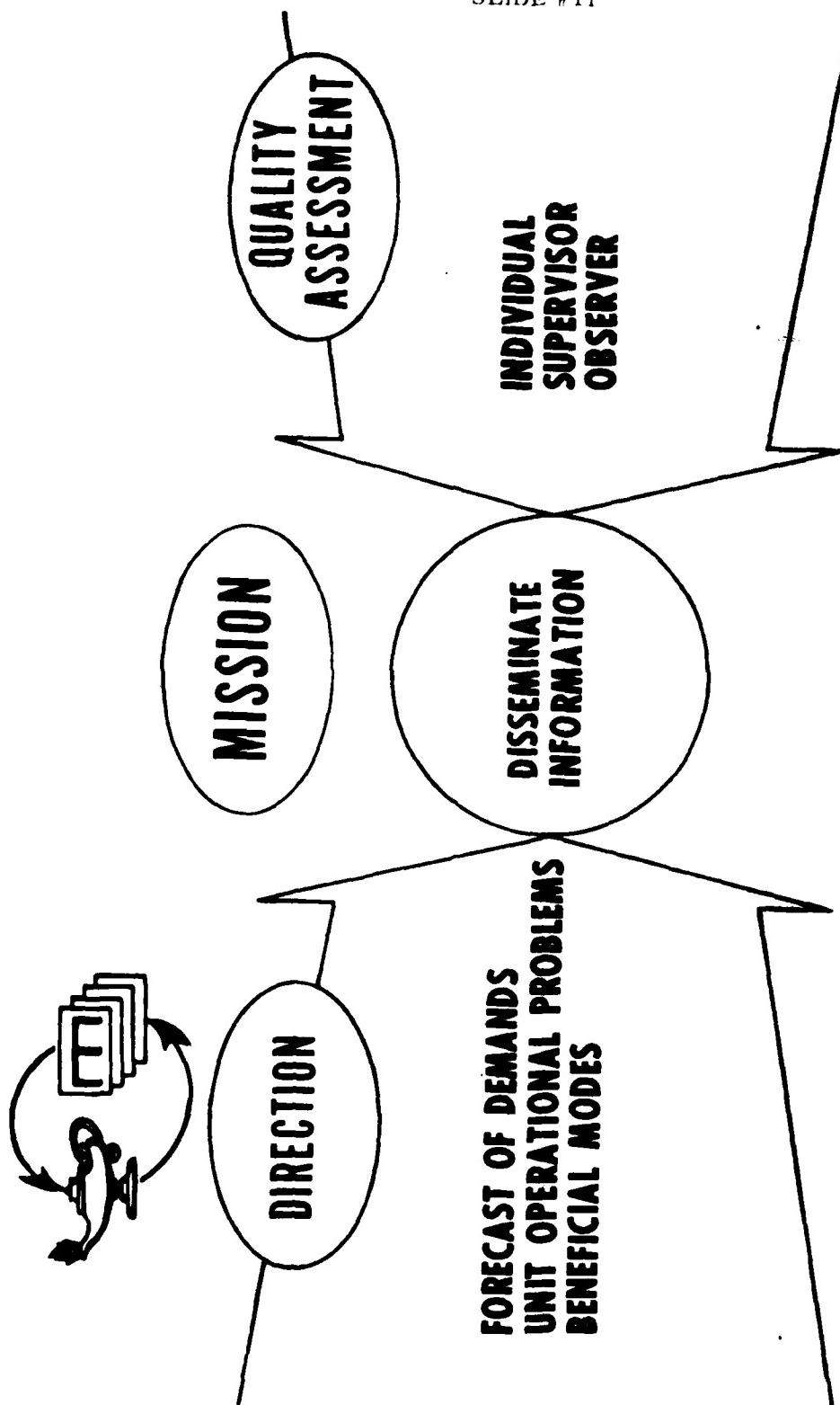
CONVENTIONAL LIMITATIONS
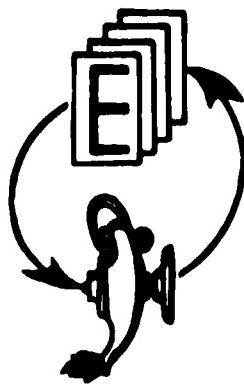
① LOW RATE OF RETURN

② COVERAGE RESTRICTIONS

③ RECIPIENT STIGMA

④ LACK OF RESPONSIVENESS
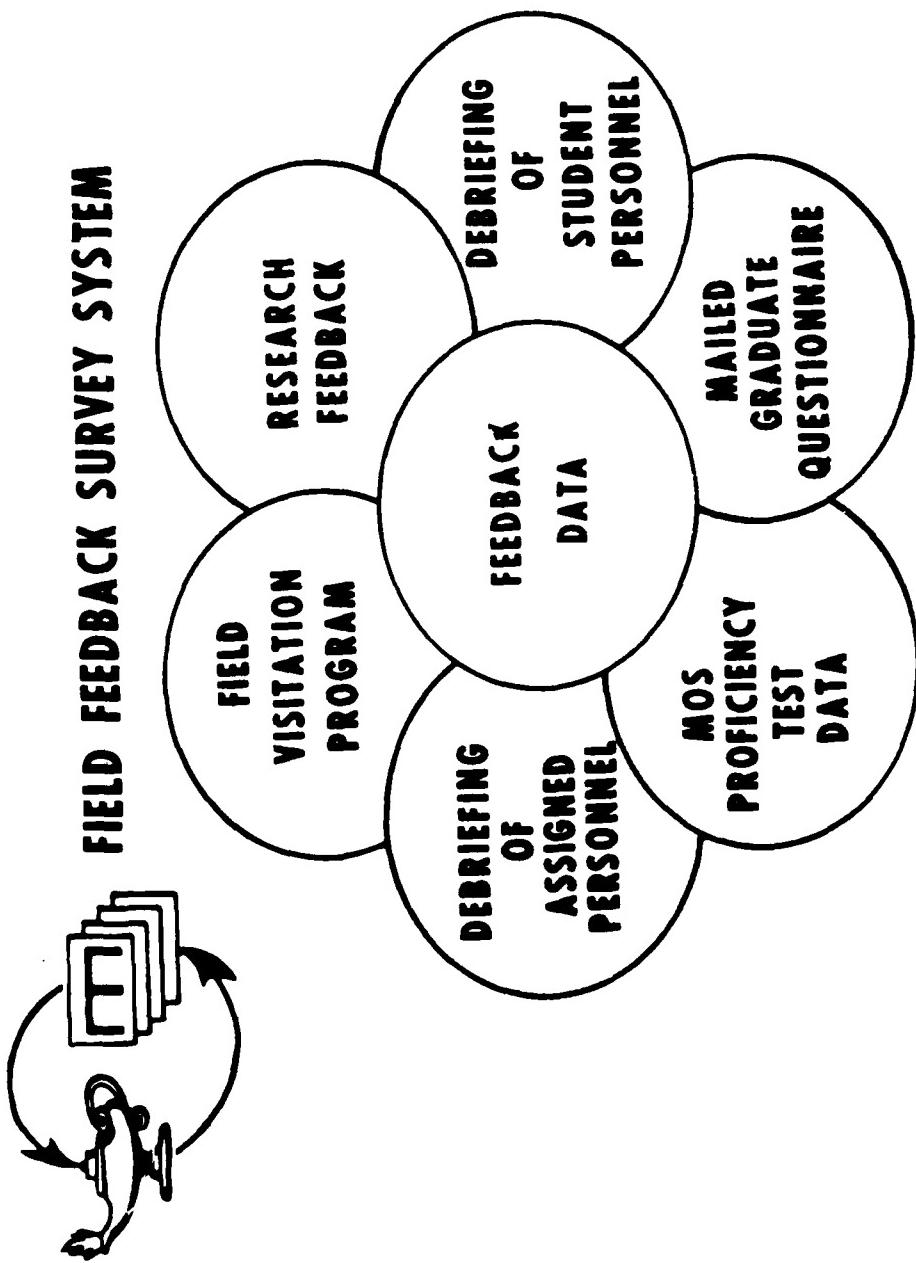
FIELD FEEDBACK SURVEY SYSTEM

RESEARCH FEEDBACK

DEBRIEFING OF STUDENT PERSONNEL

MAILED GRADUATE QUESTIONNAIRE

FEEDBACK DATA

FIELD VISITATION PROGRAM

DEBRIEFING OF ASSIGNED PERSONNEL

MOS PROFICIENCY TEST DATA

1.0

4.5
5.0
5.6
6.3

2.8   2.5

3.2   2.2

3.6

4.0   2.0

1.1

1.8

1.25   1.4   1.6

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

FIELD VISITATION PROGRAM OBJECTIVES
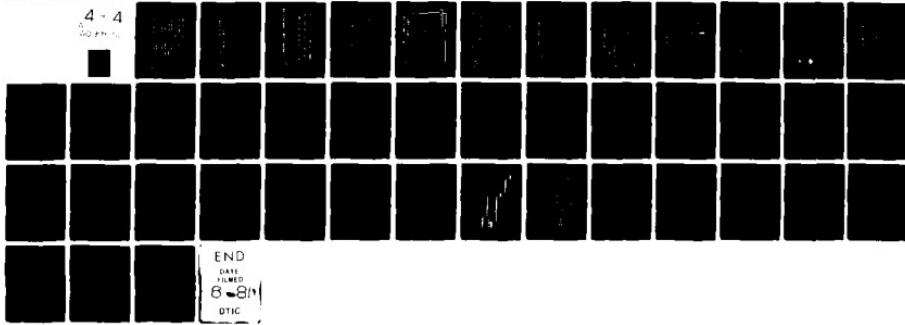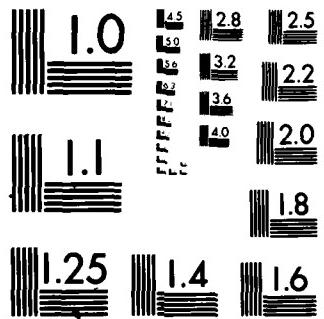
- TO VALIDATE AND MAINTAIN TASK INVENTORIES
- TO DETERMINE TRAINING COST EFFECTIVENESS
- TO DETERMINE GRADUATES ON-JOB PROFICIENCY
- TO ASSESS LEARNING EFFECTIVENESS OF METHODS/MEDIA
- TO OBTAIN REACTIONS TO TRAINING LITERATURE
- TO OBTAIN REACTIONS TO UNIT TRAINING PROGRAMS
- TO ASSESS LEARNING EFFECTIVENESS OF CORRESPONDENCE COURSES

FIELD VISITATION PROGRAM
ESSENTIAL ELEMENTS

DATA COLLECTION DEVICES

VISITATION TEAM

PROGRAM SAMPLE
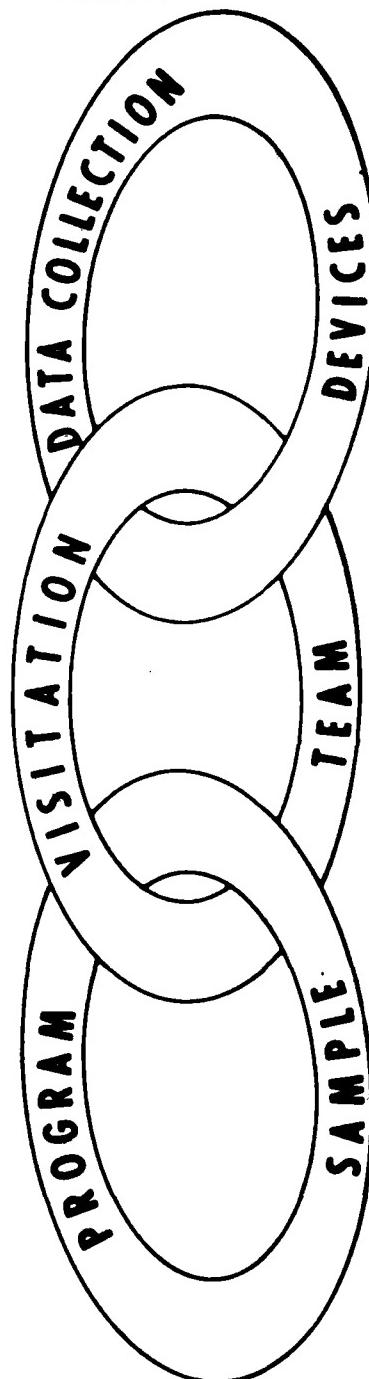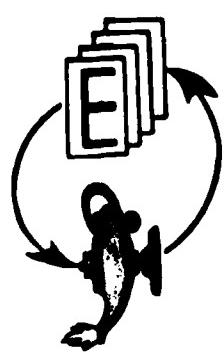
UNIVERSE SAMPLE IDENTIFICATION
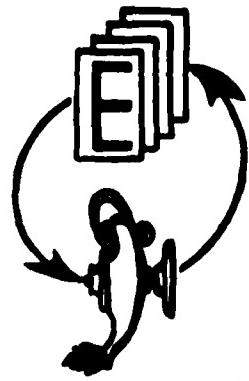
1. WHO IS TO BE INCLUDED IN THE SAMPLE?

2. HOW LARGE SHOULD THE SAMPLE BE?

3. WHERE IS THE SAMPLE POPULATION LOCATED?

SLIDE #17

FIRST PRIORITY SAMPLE

36 MOS'S

=

20 ATC COURSES

16 USAES COURSES
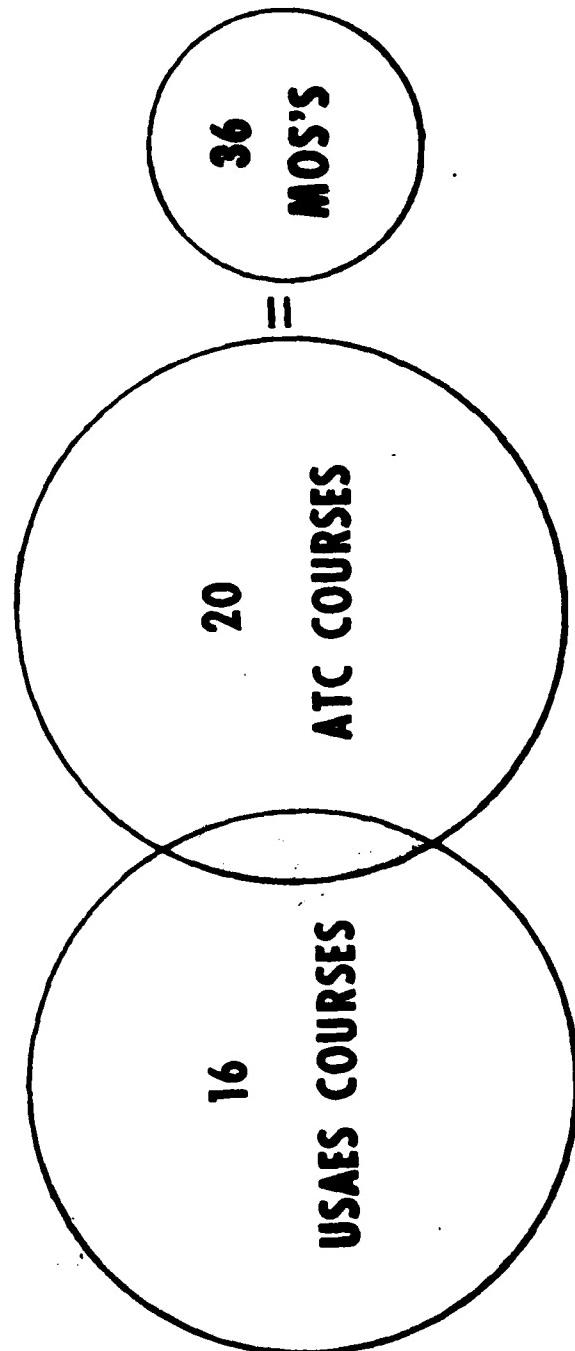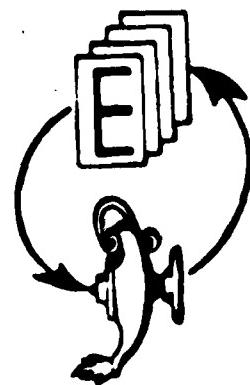
MOS COMPOSITION
OF SURVEY SAMPLE
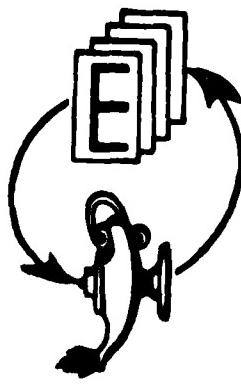
12E20	62C20	62J20	82D20
35E20	62B10	62J30	83F20
51L20	62D20	62K20	12A10
52B20	62E20	62L20	12F20
52B30	62F20	62M20	51A10
52C20	62F30	81B20	51B20
52D20	62G20	81C20	51K20
62B20	62G30	81D20	51N20
62B30	62H20	82B20	51R20

TOTAL 36

SLIDE #19

SUMMARY OF SAMPLED UNITS BY GEOGRAPHICAL AREA

V-91
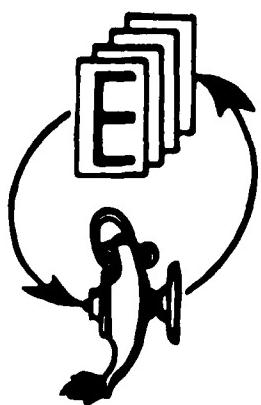
FINAL SURVEY SAMPLE

36 MOS'S
29,115 ENLISTED ENGINEERS

9,137 QUESTIONNAIRES

2,812 INTERVIEWS

SURVEY TEAM DAYS

DAY 1
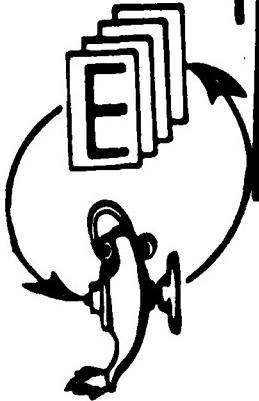
UNIT BRIEFING	1 HR
ADM OF QUESTIONNAIRE	1 HR
INTERVIEWS	6 HRS

DAY 2

| INTERVIEWS | 8 HRS |

TEAM COMPOSITION
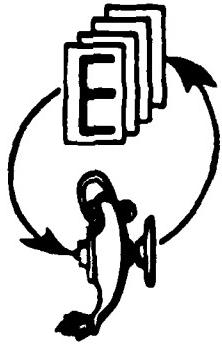
TEAM CHIEF
LT. COLONEL
COMBAT OR CONSTRUCTION ENGINEER

TOPOGRAPHIC NCO

CONSTRUCTION ENGINEER NCO

COMBAT ENGINEER NCO

MAINTENANCE WO

MULTI-MODULAR QUESTIONAIRE DESIGN
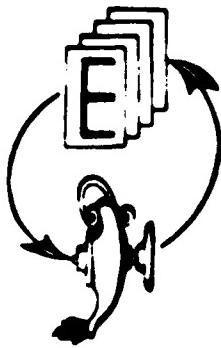
MODULE	ITEM TYPES		SAMPLE TARGET	SCHEDULE USE OF DATA COLLECTED
	MACHINE SCORABLE	OPEN ENDED		
WORK PERFORMANCE	✓	✓	JOB HOLDER	1. COURSE DESIGN 2. MOS EVALUATION 3. MOS STRUCTURING
WORK PROFICIENCY	✓	✓	SUPERVISOR OF JOB HOLDER	1. COURSE QUALITY CONTROL 2. COURSE MODIFICATION
LITERATURE	✓	✓	JOB HOLDER	1. LITERATURE UTILIZATION 2. LITERATURE IMPROVEMENT
UNIT TRAINING	✓	✓	JOB HOLDER & SUPERVISOR	1. ASSESS UNIT TRAINING 2. MODIFY UNIT TRAINING
NON RESIDENT	✓	✓	PARTICIPANT IN PROGRAM	1. COURSE DESIGN 2. COURSE MODIFICATION
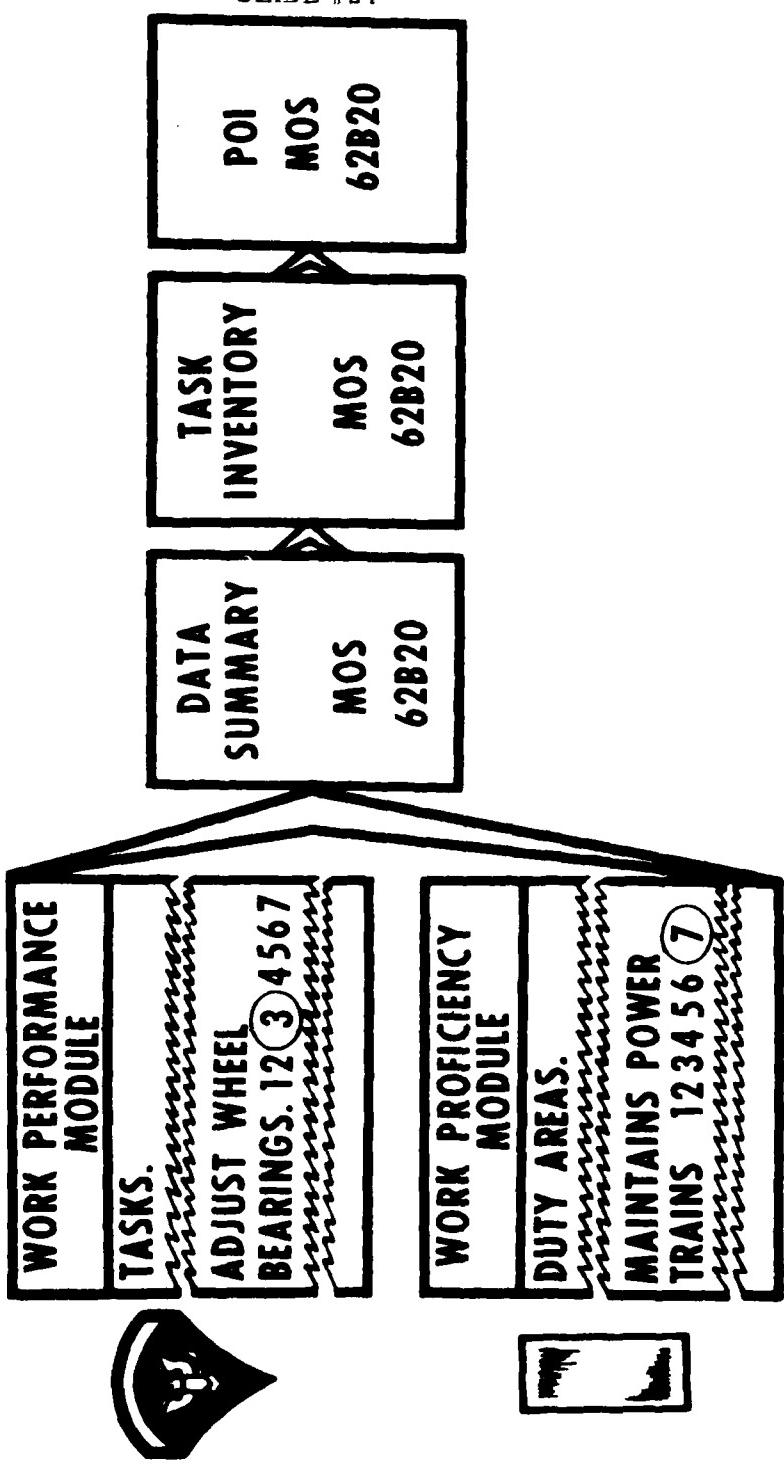
BRIEFING COVERAGE
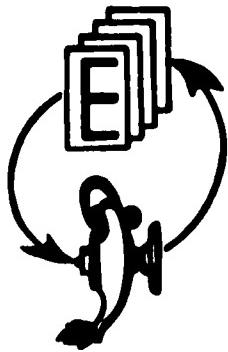
- ENUMERATED THE FEEDBACK NEEDS IN AN ARMY SERVICE SCHOOL ENVIRONMENT

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- IDENTIFIED THE TOTALITY OF THE USAES FIELD FEEDBACK SURVEY SYSTEM

- DESCRIBED THE OBJECTIVES OF THE PROPOSED FIELD VISITATION PROGRAM

- EXAMINED THE BASIC ELEMENTS OF THE FIELD VISITATION PROGRAM

USE OF TELEVISION AND VIDEOTAPES IN THE TRAINING
OF POLYGRAPH EXAMINERS AT USAMPS

Dr. Neal B. Andregg
Educational Advisor, USAMPS

The United States Army Military Police School has found that the use
of television and videotapes contributes greatly in motivating students
in our Polygraph Examiner Training Course. We present a series of
situations in which one or more of the subjects being interrogated will
use ego defense mechanisms to preserve their feelings of adequacy
and personal worth. These mechanisms such as rationalization, identi-
fication, projection and displacement, are called into play whenever
subjects find themselves in situations in which a threat to the integrity
of self is present. In each skit or situation, students are asked to
identify the ego defense mechanism which the subject used and any
remarks which were made that helped them to identify it. They are
also asked to point out any mistakes which were made in the interroga-
tion and what actions they would have taken in an attempt to solve the
case. Videotapes can be used for both class discussion and for testing.
The videocassette which I shall use in showing you portions of a video-
tape which I produced is easy to use. An instructor can use it any time
he desires to stimulate class discussion or he can employ it to test
students in many soft skills areas.

(Show ten minute videocassette)

Script of video tape: (Audio portion only)

USAMPS Presents

DYNAMICS OF HUMAN BEHAVIOR

EGO DEFENSE MECHANISMS

SCENE #1

Mr. Raciborski
Hi, Mrs. Willis, you certainly are a difficult person to keep in touch
with. This is the third time this week that I have tried to see you.

Mrs. Willis
Oh, I'm sorry. I guess I just forgot the other two appointments. When
did you try to see me?

Mr. Raciborski
Let me see now, the first time was last Monday; the second, I believe,
was the day before yesterday. Yes, Wednesday, in the afternoon.

Mrs. Willis
Oh, I remember now, when we were really busy at the office with exams
last Monday, and Wednesday I had an appointment to get my hair fixed.
I just forgot.

Mr. Raciborski
You certainly do look nice today. By the way, tell me, did you go to the
beauty shop yesterday afternoon?

Mrs. Willis
Yes, I did. My boyfriend, he likes for me to look nice.

Mr. Raciborski
That's understandable. Tell me now, Betty, considering what your income
is, how do you afford all your expensive clothes, jewelry, and daily hair
set?

Mrs. Willis
That's none of your business. I don't have to talk to you about that.
Haven't you heard of the 5th Amendment?

Dr. Andregg
What ego defense mechanism did our subject use in this situation?

(Test Item Card)

SCENE #2

Dr. Andregg
The investigator has informed the subject of her rights and proceeds with the interrogation. He thinks that he has finally persuaded her to talk. However, I will let you be the judge as to how successful he is. Please continue to watch for any ego defense mechanism.

Mr. Raciborski
Now, Betty, let's consider your expensive clothes and jewelry again. You don't really expect me to believe that you get all that on your pay.

Mrs. Willis
I could care less what you think. I don't remember where they all came from. A girl does receive gifts you know.

Mr. Raciborski
Tell me, where did you get that large diamond?

Mrs. Willis
One of my admirers.

Mr. Raciborski
Which one?

Mrs. Willis
I don't remember.

Mr. Raciborski
You don't remember. You're smart enough to realize that I couldn't believe that if my life depended on it. Don't you realize that you could get into a lot of trouble receiving stolen property?

Mrs. Willis
I'll have you know that the men I go out with can well afford to give me nice presents. They don't have to resort to stealing. Some of them even take me to the Pinnacle Club and that's only open to men of distinction.

Dr. Andregg
Did our subject use an ego defense mechanism? If so, which one did she use?

(Test Item Card)

SCENE #3

Dr. Andregg
The investigator continues with his interrogation and is persistent in his efforts to get the subject to talk.

Mr. Raciborski
Betty, just take a look at the size of that diamond. You don't really expect me to believe that you don't remember who gave you a diamond that size, do you?

Mrs. Willis
Oh, not really. How could I forget someone who has given me so many nice things.

Mr. Raciborski
What's his name, Betty?

Mrs. Willis
(PAUSE) I am not telling you his name. He's been too nice to me, and I'm not getting him into any trouble.

Mr. Raciborski
Betty, as you know, my investigation indicates that diamond is stolen property, and most likely, the other diamonds probably are also. Now again, how and where did you get them?

Mrs. Willis
Well --- several years ago this real nice man that I knew, he wanted me to try them on and I did, and he wanted me to keep them and I did. A girl would be crazy to refuse.

Mr. Raciborski
Are you sure now that it was several years ago and maybe not just several weeks ago?

Mrs. Willis
I don't pay any attention to time. He just insisted that I keep them.

Mr. Raciborski
Betty, I want his name, and I want it now.

Mrs. Willis
Well, I'm not going to tell you his name. He's been too nice to me, and I'm not going to squeal on him.

Mr Raciborski
Betty, think of this a minute. I know the girl who lost those diamonds. She is a very sensitive person. She has attached a great deal of sentimental value to them. In fact, I would bet right now she's crying her eyes out. Now, you wouldn't want to wear those diamonds if you knew, by so doing, you would be making someone miserable, would you?

Mrs. Willis
No, I wouldn't, but neither would I want to get someone in trouble that's been so nice to me and given me so many nice things and always wanted the very best for me.

Mr. Raciborski
Well, Betty, I guess we might as well stop wasting time. I'll just have to find out who he is without your help. For now though, I'm going to need those diamonds for the purpose of making a positive identification.

Mrs. Willis
(PAUSE) Well, you can have them, but you'll have to give me a receipt, and I'm sure that you'll find they are not stolen as I have been told they are insured for several thousand dollars.

Dr. Andregg
What ego defense mechanism did our subject use?

(Test Item Card)

Dr. Andregg
What remarks did she make that led you to select this ego defense mechanism?

(Test Item Card)

SCENE #4

Dr. Andregg
The subject has just returned from the interrogation conducted by the criminal investigator and is talking with her co-workers. Be alert for any ego defense mechanism which she may use.

Mrs. Sizemore
Say, Betty, you really do look bushed. You look like you've been through the mill. How about me getting you a coke?

Mrs. Willis
Yes, I think I need one after that grilling that I've been through. I have never been asked so many embarrassing questions in such a short period of time.

Mrs. Sizemore
(Gives coke to Mrs. Willis)   Maybe this will make you feel better.

Mrs. Willis
Oh, thanks. Thanks. This really hits the spot. Maybe it will help me forget that rude investigator who asked me all those personal questions.

Mrs. Prince
(Walks into the scene)   Oh, is somebody asking you personal questions?

Mrs. Willis
What if they were. It's no concern of yours. You're as nosy as some of those old biddies at the beauty shop.

Dr. Andregg
What ego defense mechanism, if any, was used in this situation?

(Test Item Card)

SCENE #5.

Dr. Andregg
The subject talks with her boyfriend the day following the interrogation. Remember that both individuals may use ego defense mechanisms in this situation.

Mrs. Willis
Honey, am I glad to see you. That investigator asked me some really embarrassing questions, but I didn't implicate you.

Mr. Moree
That's real nice of you, and I appreciate it. As a matter of fact, this evening, I'll show you just how much I do appreciate it. What did you do, clam up completely?

Mrs. Willis
Well, I did tell him a little bit when he inferred that you were a common
thief. He insulted you.

Mr. Moree
Just what did you tell him?

Mrs. Willis
Well, I told him that the men I go out with could afford to give me nice
gifts and take me to nice places, they don't have to resort to stealing.

Mr. Moree
Did you give him any names of places?

Mrs. Willis
Not at first, but he kept bugging me and making me nervous, so I finally
mentioned the Pinnacle Club.

Mr. Moree
Well, that's great, that will throw him off completely. We just won't go
back there anymore. As a matter of fact, we always have more fun at
the other nightclubs anyway.

Dr. Andregg
What ego defense mechanisms were used in this scene, and by whom were
they used?

(Test Item Card)

Dr. Andregg
How would you use your knowledge of human behavior and ego defense
mechanisms in an attempt to break the case?

(Test Item Card)

USAMPS has also developed similar videotapes in other soft skills areas
and use television cameras and playback equipment to record and critique
instructor's presentations and counseling and interrogation techniques of
students. We have found these methods most effective in improving these
soft skills, in developing and maintaining student interest, and in motivating
our students to learn more effectively.

COLONEL G. B. HOWARD

Colonel Howard is currently the Product Manager for CONARC's Computerized Training System, having come to that assignment from Germany where he was Commanding Officer of the 4th Signal Service Group and Community Leader for the Karlsruhe area. Prior to that, he served two years of duty with the U. S. Delegation to the NATO Military Committee in Brussels, Belgium.

Colonel Howard graduated from The Citadel in 1945, and entered the Army as a Private in October of that year. After a year of enlisted service, he was given a direct commission as a 2d Lieutenant in the Army of the United States.

Colonel Howard has served on the staff and faculty of the Army Security Agency School, the Signal School, the Command and General Staff College, and the Army Artillery School. His military schooling includes enlisted attendance at the Army Security Agency School, the Signal Officers Advance Course, a Spanish course at the Army Language School, the Command and General Staff College, and the Army War College.

His other assignments include ASA detachment commander in Trieste, Signal Company Commander during the Korean conflict, four years as Plans Officer and Nuclear Weapons Officer in the 5th Division Artillery, two years of advisory duty in Ecuador, and a tour with the Headquarters of US Army Vietnam.

His awards and decorations include the Legion of Merit, the Meritorious Service Medal, and the Army Commendation Medal with Oakleaf Cluster. An Eagle Scout himself, Colonel Howard has served thirty-two years with boy scouting and is recipient of the Silver Beaver Award. He is also in the Sunday School program, having served as superintendent or teacher on each of his assignments. His other interests include tennis and bowling.

CONARC PROJECT ABACUS
A Prototype Computerized Training System for the Army

Colonel G. B. Howard
Product Manager, USASCS

INTRODUCTION

The purpose of Project ABACUS briefly stated is to develop, test and evaluate a large-scale prototype Computerized Training System (CTS), which combines the application of Computer Assisted Instruction (CAI) and Computer Managed Instruction (CMI). The project will cover the four year period beginning 1 August 1972 and ending 1 August 1976. It is under the direction of the Office of the Product Manager (PM), located at the U. S. Army Signal Center and School, Fort Monmouth, New Jersey.

BACKGROUND

A six-month study conducted by the Director of Management Information Systems, Department of the Army, resulted in the establishment by CONARC of a Computer Assisted Instruction (CAI) Task Group in November 1971. The group was chaired by a representative of the U. S. Army Signal Center and School and included participating members from ten other CONARC schools. The final report, submitted in April 1972, recommended initiation of the prototype to include integration of CMI-CAI, use of a multiprocessor mini-computer concept for the central system, and use of a variety of course types for evaluation. Although directed to concentrate on technical training, the group noted in its findings that soft-skill courses might be even more cost effective for CAI. An outgrowth of the group's recommendations was the establishment of Project ABACUS. The USASCS was selected for the site for the Product Manager's Office because of the existing expertise at that location.

CAI AT USASCS

The CAI Project at USASCS originated in August 1966 for the purpose of investigating the feasibility of employing CAI in conducting Common Basic Electronics Training. Using an IBM 1500 Instructional System, the project conducted a training and evaluation program encompassing four years, during which more than 1300 students underwent training. The technical reports and papers resulting from this effort are considered among the most authoritative in the entire field of CAI. As a part of the evaluation, a closely controlled experiment was conducted to compare CAI with

convention classroom instruction. The results are shown in Figure #1. From this data it was concluded that CAI was not only feasible from a training effectiveness standpoint, but could bring about significant savings in training time.

PROJECT SCHEDULE

The scope of the CTS Project includes the design, development, implementation, operation and evaluation of the integrated prototype CTS.

The project will be carried out in five separate phases: (See Figure #2).

1. System Design. The Human Research Resources Organization (HumRRO) is under contract for design with direction and guidance from the PM through the Army Research Office (ARO). This phase runs through the first ten months of the project which began 1 August 1972 and involves the specific design of a complete system for use by the Prototype CTS.

2. System Development. Based on specifications determined in Phase 1, a contractor will be selected by the middle of next year. The system development contractors will be responsible for the integration of the hardware/software into an operational system.

3. Course Development. The PM is responsible for development of the course material for implementation of the prototype CTS. The Office of the PM has a head start on this phase. Student terminals connected to the PLATO IV System at the University of Illinois will be used to train personnel as instructional programmers and for initial development of the course material designated for the Prototype CTS.

4. CTS Operation. The prototype system will operate a minimum of one year prior to procurement of operational systems. This phase is scheduled to begin in January 1975 and run through April 1976.

5. CTS Evaluation. Evaluation will be conducted by the PM concurrently with Phase IV, and will address the feasibility and effectiveness of the entire system. It will conclude in August 1976. Contractor support will be used as appropriate.

ORGANIZATION

The relationship of the Product Manager to other agencies is given in Figure #3. It will be noted that the command line is direct to CONARC, with monitorship provided by USASCS. All activities are conducted under

a charter similar to that covering project managership within the Army Materiel Command. The Steering Advisory Group (SAG) has the responsibility for monitoring the CTS project for the Department of the Army. The SAG meets monthly and provides a mechanism for coordination, exchange of information, and review of the Prototype CTS project by all interested parties. The SAG also exercises control over the functional requirements and technical characteristics of the Prototype CTS. The Chairman of this group is the Director of Army Research, the Product Manager of the CTS is the Executive Secretary of the SAG, and the following agencies supply membership on the SAG: DA, DMIS; DA, DCSPER; OCRD; USCONARC; USASCS; and the Office of the Product Manager.

Internally the Office of the Product Manager is organized as shown in Figure #4. Additional personnel will be required as the project progresses, particularly in Course Development and Systems Operations. The Evaluation Division will remain small with support being provided through contractors/consultants as required.

HARDWARE

As mentioned earlier, the hardware will be based on the multi-processor mini-computer concept. The interrelationship of the major components for such a system are shown in Figure #5.

Major design considerations or characteristics have been established for CTS so that it can function effectively and efficiently in providing a group of students with a highly adaptive, self-paced training environment. These are identified and briefly discussed as follows:

Number of Terminals. As presently conceived the initial version of the system will contain 128 terminals and have the capability to expand to about 1000 terminals.

Subject Matter Storage. The system will have the capability to store subject matter equivalent to about 900 hours of conventionally presented instruction.

Response Time. The system will process an entry made by a student and return appropriate information to the student within a time delay not exceeding four seconds. It is expected that the system response time will average about 2 - 3 seconds.

Remote Terminal Operation. The system will be capable of servicing terminals distributed in a typical military training complex. The maximum

distance between a terminal and the computer is established at about five miles. This capability will be attained without resorting to special interfacing.

On-Line Entry of Course Material. All course material as it is developed will be entered directly into the system from a terminal. Punched card entry will be limited to specialized activities involving the operation of the system and batch processing.

Simultaneous Operations. The system will enable simultaneous activity by students and instructional programmers. This means the course authoring and debugging can take place while students are receiving instruction. The requirements for the inclusion of batch processing among the simultaneous operations is not firmly established at this time. This activity can take place during the third shift.

Instructional Model. The decision making process incorporated in the instructional model will be attentive to the latest advances in education and training technology. However, the level of sophistication will be initially limited to techniques and strategies of proven merit.

Authoring Language. The language will consist of the necessary commands to enable the computer system to present subject matter in the context of the instructional model. These commands will be designed to require a minimal coding effort for course materials development. In addition, the language will contain the necessary commands to simplify on-line authoring and debugging.

The terminal configuration shown in Figure #6 is not necessarily the one that will be used in CTS, but is presented as a possible configuration that will provide a very effective learning environment. From the student's point of view this environment is the most important part of the system because, after all, it is here that learning takes place. The multi-media aspect of the terminal configuration is readily apparent. Considering the fact that the student will spend a considerable part of each day in this environment, the multi-media approach will provide sufficient variety in activity to lessen the effects of fatigue or boredom that would normally accrue from extended exposure to a single medium or activity. Furthermore, the multi-media configuration will enable the instructional programmer to utilize a mix of media that is most appropriate for developing course materials geared to the attainment of specific training objectives. The devices shown are described as follows:

1. Primary Display. This device is essentially a TV receiver. It can be connected directly to the central computer system or to the closed

circuit television system. Most of the time the primary display device will be connected to the central computer system for self-paced interactive instruction. Group instruction or briefings can be provided by switching the device to the closed circuit television system. Typical examples of this utilization are command briefings, safety and security lectures, and special announcements. In addition the video cassette can be utilized to provide supplementary instruction. The audio capability required for closed circuit TV and video cassette modes of utilization can also be employed when the primary display is connected to the central system. Display of textual material by the primary device will be free of flicker and consist of characters no less than 1/4" in size. The total text handling capability will be about 600 individual characters. The primary display will also have a graphics capability involving simple line drawings such as schematics and pictorial representations.

2. <u>Keyboard</u>. The keyboard will provide the student with a means of answering questions or requesting information. It will consist of a standard typewriter keyset with additional special function keys to simplify operation of the terminal. For example, a NEXT key will be provided so that the student can indicate to the computer that an answer has been completed or a request has been made.

3. <u>Secondary Display</u>. This part of the terminal configuration is used to provide illustrations to supplement the textual instruction presented on the primary display. Generally speaking, the illustrations are of a higher order of complexity or detail than can be presented on the primary display when it is connected to the central system. In addition, the secondary display is used when a sufficient area is not available on the primary display for simultaneous display of text and graphics. The device is normally a rear screen filmstrip or micro-fiche projector. Synchronization with the textual material on the primary display is obtained by giving each frame a code. Thus, the instructional programmer can call up a specific frame to supplement textual material.

4. <u>Touch Panel</u>. This device adds a new dimension to the multimedia capability of the terminal because it can be used to overlay any display whether or not the display is connected to the central system. For example, it can overlay a schematic diagram used for teaching circuit analysis or troubleshooting. Its operation is very simple because the student need only touch his finger to the point of interest which is automatically identified by the computer. Thus, the student can devote his full attention to the display without the distractions of light pen or keyboard operation.

5. **Training Equipment and Devices.** The presence of training equipment and devices within the terminal configuration attests to the attention given to the "hands-on" approach to training advocated by CONARC. Experience at USASCS has conclusively demonstrated that students can be taught practical skills by means of computer assisted instruction and that the varied activity inherent to this approach maintains a high level of student interest and motivation.

COURSE DEVELOPMENT

Instructional materials developed for CTS will comply with CONARC training policy. This means that the instruction will reflect the systems engineering approach to training with great emphasis placed on the development of job skills and knowledges. Furthermore, care will be taken to assure that the training methods and media used within CTS are appropriate for the attainment of specific training objectives and not because of "gimmick" appeal. Generally speaking, the course material will be developed for presentation on-line in the terminal configuration and off-line in practical exercise labs. The on-line course material will employ CAI modes such as tutorial, drill and practice, and dialogue. The off-line instruction will be computer managed to take full advantage of the diagnostic and record keeping capabilities of CTS.

The steps involved in developing a CAI course of instruction are given in Figure #7. It will be noted that, with the exception of the on-line review, testing and debugging, these are the same as for any other systems engineered course.

As shown in Figure #8, each lesson module consists of a pretest, lesson element, and a lesson review. The terminal performance objectives with their associated enabling objectives are used to develop each of the components of a lesson module. The pretest is used to permit a high or middle aptitude student to advance to the next lesson if he demonstrates sufficient prior knowledge of the subject. The lesson review items are used to ascertain if the desired terminal behavior has been developed by the lesson element. The instructional programmer follows a general procedure in the preparation of the lesson module. First, a pretest and lesson review items are prepared, then the lesson element is written. Slides, training devices, audio scripts and special video displays are originated concurrently in the preparation of the lesson module. Then, the module is coded for computer implementation. This is a separate task, and may be done either as the lesson is being written or after the instructional content is completed.

The sample model is similar to the one used in the CAI Project at USASCS. It is rather straight-forward and uncomplicated, but it must be remembered, the more complex the model, the greater the task and time required to prepare the lesson material. Variations will naturally be required for special lessons such as the conduct of practical exercises.

EVALUATION

The CTS evaluation division will conduct Phase V of the general development plan as provided for in the CTS Management Plan. As indicated in the plan, "This phase will be conducted by the Product Manager concurrently with Phase IV (CTS Operation) and is concerned with the feasibility and effectiveness of the entire system. Thus, one of the focal targets set for this CTS Project is an in-depth and in-breadth evaluation of the CTS prototype, both from a components and a systems point of view.

From the start, it was decided that the CTS system should not be viewed "in vacuo". It was readily apparent that the CTS Project carried with it a definite evolutionary history and had certain prospects for future development and operational use as well. Thus, it is to be expected that the final CTS evaluation plan will be a resultant of several vectors including: (a) past impetus of CONARC/USASCS CAI efforts (e. g. , summative evaluation/Task Group Report); (b) current CTS planning (e.g., management/time phase plans); and, (c) Army needs/expectations (e. g. , potential operational problems). Taking into consideration information from these three sources, it is anticipated that the ultimate evaluation product will not be a sterile "in vitro" assessment of CTS, but a realistic "in vivo" appraisal with many practical implications.

At the present time, the CTS evaluation division is mapping out the evaluation domain limits. Five basic sub-areas have been identified for the feasibility and effectiveness evaluation:

1. Hardware

2. Software

3. Cost

4. Courseware

5. Student

For the sake of expediency, and by the logic of their relationships, these five basic areas will be consolidated into three broad evaluation areas, which incidentally coincide with three organization branches within the CTS evaluation division:

1. Systems effectiveness

2. Cost effectiveness

3. Educational effectiveness

The CTS system will be examined from a hardware and software components perspective, and, ultimately from a systems perspective. More specifically, the essential functions which must be supported by the CTS are as follows:

A. Interactive Processing

   Student Mode

   Author mode

   Administrative mode

   Proctor mode

B. Batch processing

   Author processing

   Proctor processing

   Administrative processing

The evaluation will, of course, address the feasibility and effectiveness of all these functions.

The cost of the CTS system is, of course, not a trivial matter. A multi-dimensional assessment of CTS costing will be undertaken which will include:

1. Type of cost (Capital/Developmental/Operating)

2. Purpose of cost (Direct/Indirect/Noninstructional)

3. Area of cost (CAI/CMI/sub-areas)

It is anticipated that the derived cost model will not just represent mere cold statistics, but be related to and suggestive of degrees of educational benefits accrued by the costing dimensions.

Lastly, the pre-eminent concern of educational effectiveness will be investigated. This comprises both the courseware and the student. In keeping with the in-depth and in-breadth nature of the evaluation, a formative-summative paradigm will be employed to assess the educational effectiveness of the CTS. By definition, the formative evaluation will address the internal validity/reliability of the CTS instructional material. In contrast, the summative evaluation will focus on the integrity and validity of the training system in comparison with other external criteria (COBET/Field Radio Mechanics/Circuit Conditioning) as reflected in student performance, attitudes and other predefined indices of reference.

Past, and recent, contacts with many external agencies and associations (ADIS, ETS, NYIT, IBM, etc.) have assured us that our evaluation plans are contemporaneous with the state-of-the-art. For added insurance in this regard, plans are also being made to organize three teams of consultants for the three basic evaluation areas discussed above.

CURRENT CAI PROJECTS

Although there are literally hundreds of CAI experiments being conducted throughout the country, few attempts are being made at sophistication as many potential users await the outcome of developments being sponsored by the National Science Foundation and by the Armed Forces. Most new systems use teletype compatible terminals in the simple drill and practice mode. The trend in public schools is to take advantage of the consortium approach. Meantime, the real pioneers continue to experiment in a variety of ways. These include Suppes at Stanford, Mitzel at Penn State, Hansen at Florida State, Stolurow at Stonybrook, Morgan at Montgomery County (Md), Bunderson at Brigham Young, and Zinn at Wisconsin.

The largest and most advanced developmental project is being sponsored by NSF at the University of Illinois under the direction of Dr. Bitzer, another of the pioneers. The system, known as PLATO IV, utilizes a large scale computer and is being designed to support as many as 4000 terminals provided access to no more than 400 different subject areas is required at the same time. The terminal consists of a relatively low-cost plasma tube display with a keyboard, a touch panel and microfiche projection. These terminals will eventually be located on campuses, in schools, and on military installations for test purposes. The three Armed Forces are

participating through sponsorship of the Advanced Research Planning Agency (ARPA). The entire project will be evaluated by ETS for the next three years.

The second NSF sponsored project is being conducted under a contract with MITRE Corporation. The contract calls for experimental courses in reading and math at two junior colleges, one in Virginia, and the other in Arizona. The system uses the mini-computer concept to support up to 128 student terminals. The terminal consists of a modified commercial television set and a keyboard. Random access sound is still questionable. Course material for use on this system is being prepared at Brigham Young under Dr. Bunderson. Evaluation again will be by ETS.

The United States Air Force has prepared specifications and requested bid on a system similar to the PLATO IV. Schedule calls for development and evaluation over a four year period.

The United States Navy is concentrating on Computer Managed Instruction (CMI). A large scale experiment using the computer to direct students through courses and maintain records of their progress is currently being conducted at the training center in Memphis, Tennessee.

From the above, it can be seen that results of all large experiments are due during the 1975 - 1977 time frame. It is unlikely that any other major developments can be completed and tested prior to that time.

SUMMARY

Project ABACUS has as its purpose the development and evaluation of a large scale prototype Computerized Training System (CTS), which combines CAI and CMI functions. The goal is a suitable, low cost, viable, and effective hardware system, and a newly developed language that will facilitate course development and provide maximum flexibility. From the prototype, design specifications can be prepared to meet the needs of CONARC schools and training centers.

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CAI VS CI DATA SUMMARY

ACHIEVEMENT

	PH I (WKS 1-2)			PH II (WKS 3-4)		
	N	WT	PT	N	WT	PT
CAI	139	77.4	80.9	120	78.2	84.5
CI	142	76.4	78.7	126	77.2	82.6
DIFF		+1.0	+2.2		+1.0	+1.9

TIME

	PH I		PH II	
	N	HOURS (AVG)	N	HOURS (AVG)
CAI	139	34.76	120	46.08
CI	142	53.83	126	71.43
DIFF		19.07		25.35
REDUCTION		35.4%		35.5%

NOTE: 1. CI = CONVENTIONAL INSTRUCTION
2. CAI AND CI GROUPS WERE MATCHED ON A PREDICTED SCORE
3. ACHIEVEMENT INDICATED IN AVERAGE SCORES
4. TRAINING TIME AVERA ɣ INCLUDE RECYCLING TIME

V-118

FIGURE 1

TIME-PHASE PLAN
COMPUTERIZED TRAINING SYSTEM
(CTS)

FIGURE 2

SYSTEM DESIGN — 10 MO

INSTRUCTIONAL PROGRAMMER TRAINING — 6 MO

SYSTEM DEVELOPMENT — 18 MO

COURSE DEVELOPMENT — 22 MO

DEBUG — 4 MO

EVALUATION — 12 MO

REPORT PREPARATION — 4 MO

AUG 72   FEB 73   JUN 73   DEC 74   APR 75   APR 76   AUG 76

LEGEND: ▨ CONTRACTOR   ■ IN HOUSE

V-119

DA

CONARC

USASCS

CSSEC

CONTRACTOR

OFFICE
OF THE
PRODUCT MANAGER

DOD
ACTIVITIES

CIVILIAN
INSTITUTIONS

SAG
CONARC
DCSPER
DMIS
OCRD
USASCS

ARO

HumRRO

DIRECTION
MONITOR
SUPPORT
COORDINATION

V-120

OFFICE OF THE PRODUCT MANAGER
COMPUTERIZED TRAINING SYSTEM

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                    ┌──────────────────┐
                    │     OFFICE       │
                    │     OF THE       │
                    │    PRODUCT       │
                    │    MANAGER       │
                    └──────────────────┘
                             │
         ┌───────────────────┼───────────────────┐
         │                   │                   │
┌──────────────┐   ┌──────────────────┐   ┌──────────────┐
│   COURSE     │   │     SYSTEM       │   │  EVALUATION  │
│ DEVELOPMENT  │   │   OPERATION      │   │              │
│     AND      │   │      AND         │   │              │
│  OPERATION   │   │  PROGRAMMING     │   │              │
└──────────────┘   └──────────────────┘   └──────────────┘
```

OFF	EM	CIV
7	12	20

FIGURE 4

CTS HARDWARE

JOB PROCESSOR

MASS STORAGE (DISK)

SWAP MEMORY DRUM

JOB PROCESSOR

JOB PROCESSOR

MASTER PROCESSOR

MASTER PROCESSOR

PERIPHERAL EQUIPMENT

TERMINAL

32 TERMINALS

32 TERMINALS

32 TERMINALS
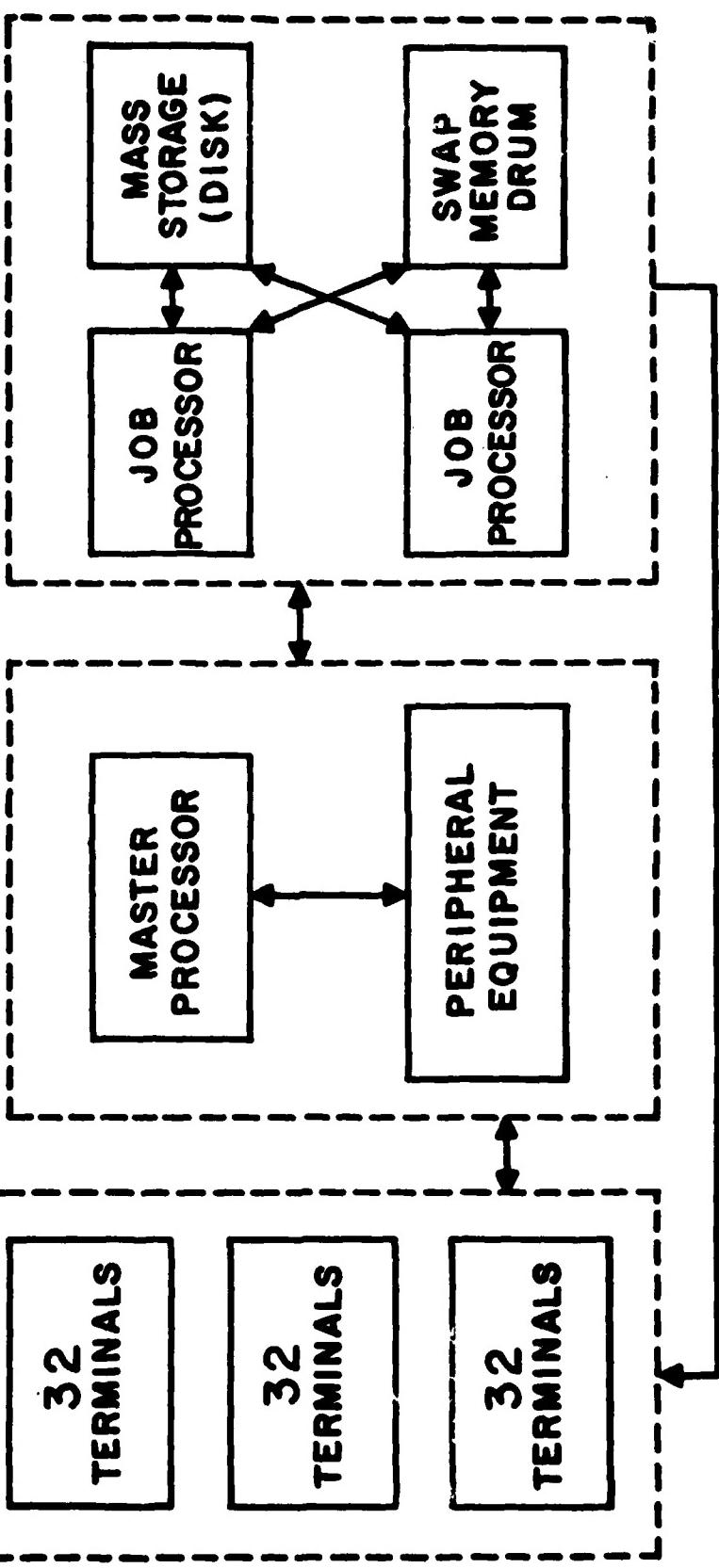
32 TERMINALS

FIG. 5

TYPICAL TERMINAL CONFIGURATION

CENTRAL SYSTEM

VIDEO CASETTE

CLOSED CIRCUIT TV

SECONDARY DISPLAY

TRAINING DEVICES & EQUIPMENT

TOUCH PANEL

HEADSET

PRIMARY DISPLAY

KEYBOARD
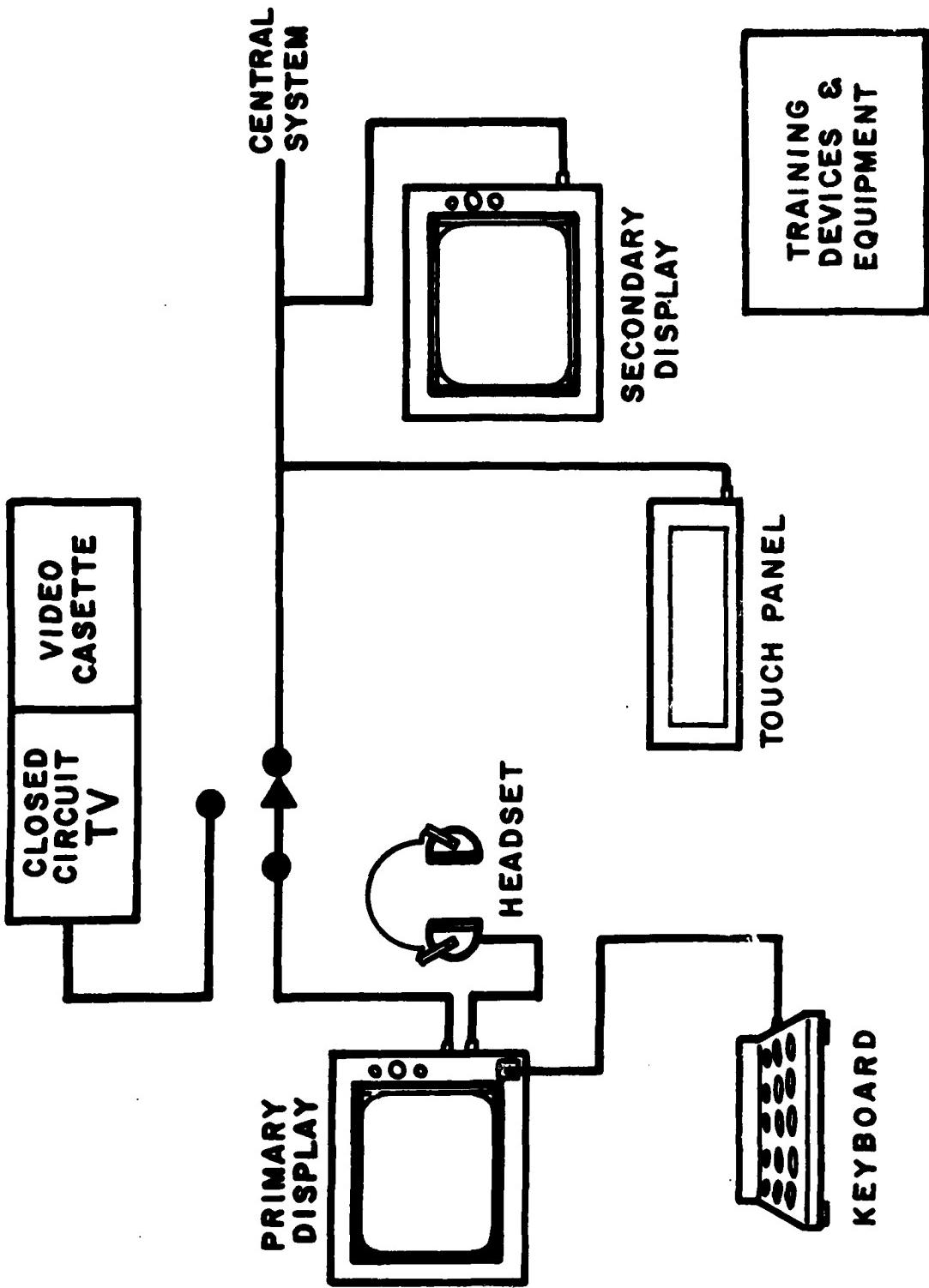
FIGURE 6

V-123

CAI
DEVELOPMENT
STEPS

FIGURE 7

V-124
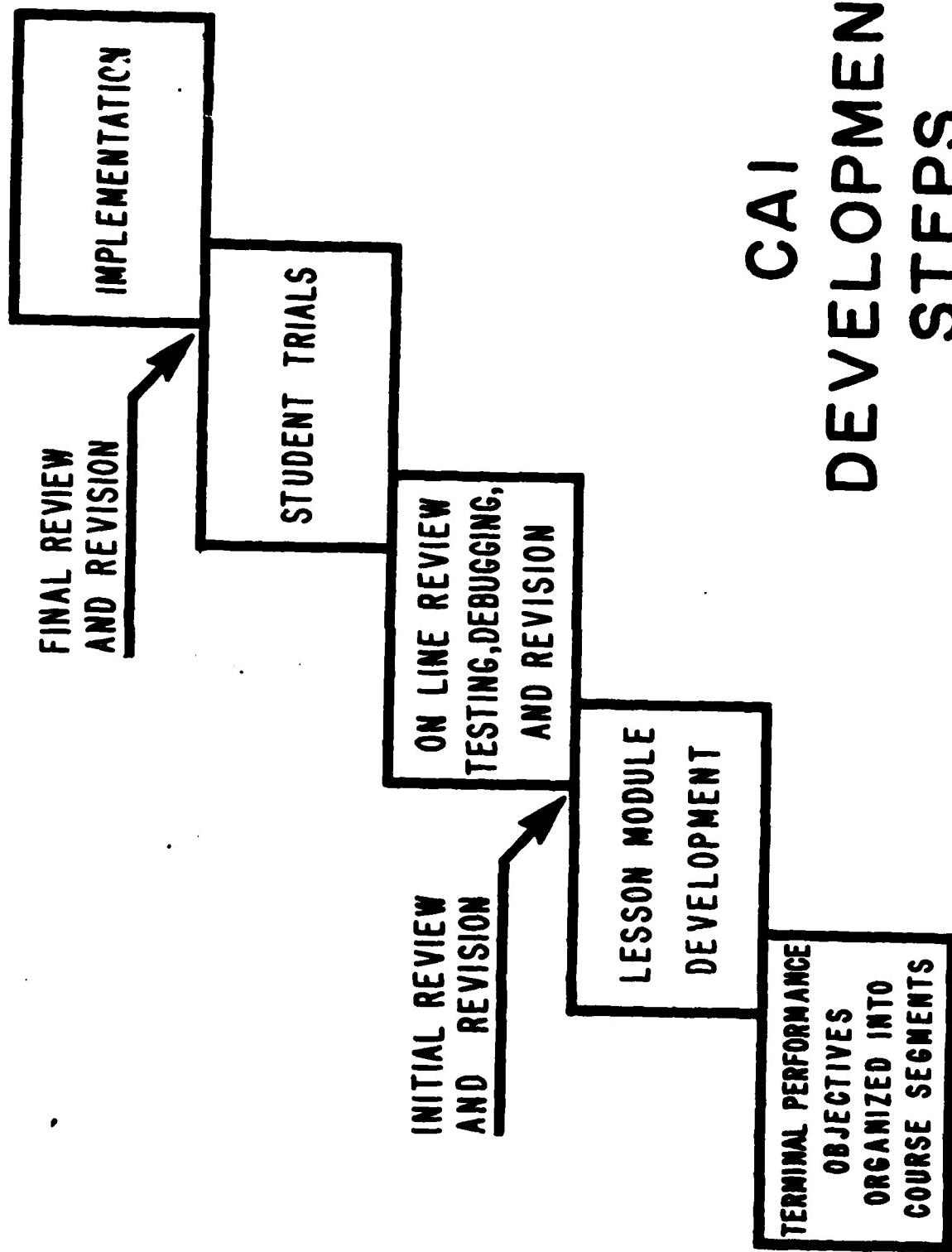
LESSON MODULE Instructional Flow

FIGURE 8

V-125
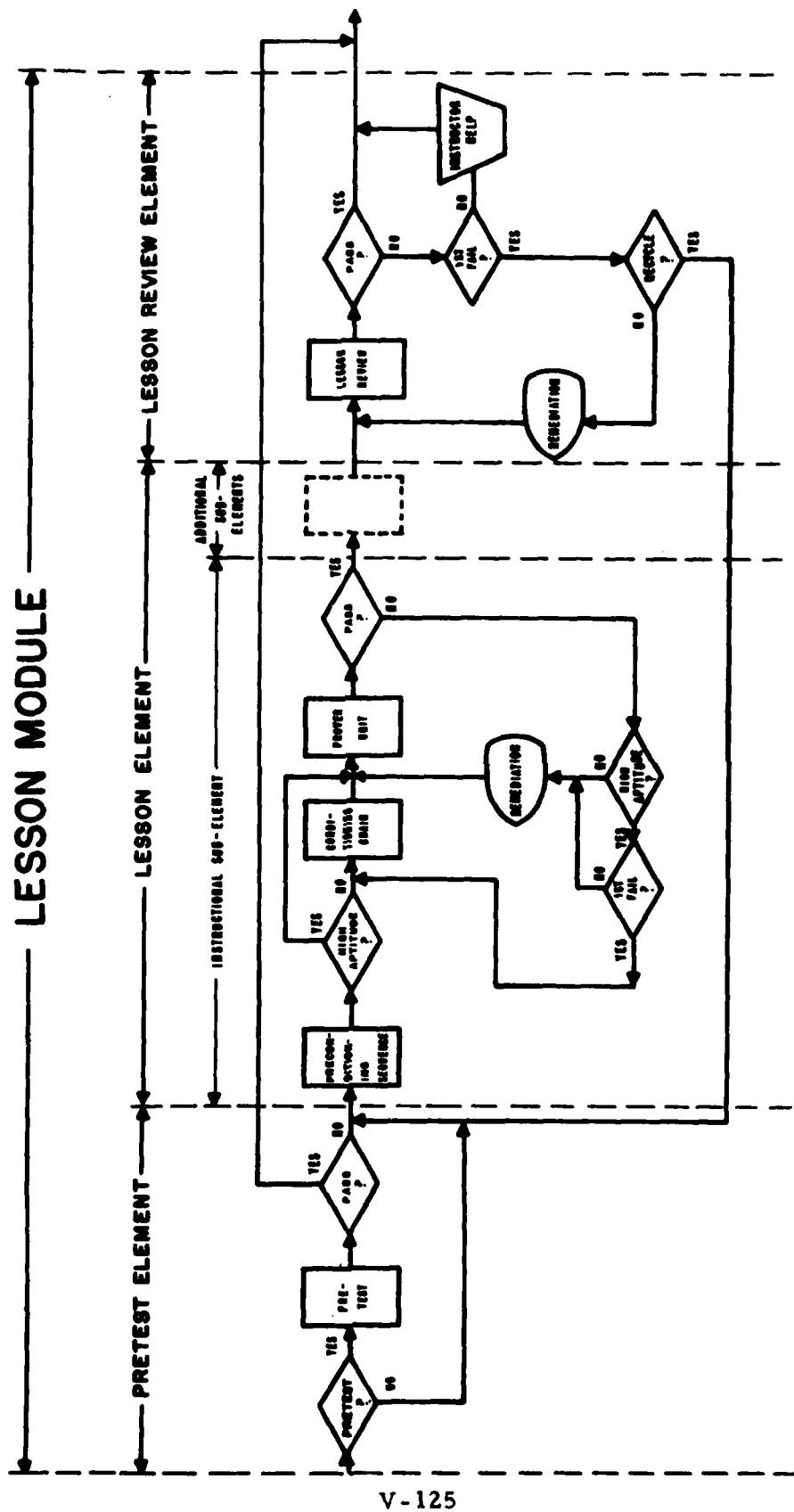
OBSERVATIONS AND SUMMARY

DR. RICHARD W. BURNS

Resource Consultant, Soft-Skill Training Developments

1. The workshop was well attended and the attendees were interested as evidenced by the large number of questions directed to each speaker.

2. The conference format was tightly scheduled (I know why) and perhaps in the future more time should be allowed for one- to- one interaction between attendees and speakers.

3. Your personal chairmanship is to be commended for keeping to the schedule.

4. One theme which ran through most of the presentations involved the difficulties experienced in training where the objectives involved people-people types of performances. Specifically I'm referring to skills relating to leadership, decision making, problem solving, communication and peer relationships. I was pleased to note that much progress in this area has already been made and that continued efforts are being implemented. Further exploration of role playing, simulation and trainee involvement in interactive process should result in positive benefits to the training programs.

5. The military recognizes and is concerned about the changing role of the military system, the changing role and quality of the trainees and the changing role of instructors in the training programs. This is a healthy point of view as evidenced by the provisions for feedback mechanisms to the system.

6. I sense that the task of training instructors is made more burdensome because of the high rate of turnover. I would recommend that this problem be thoroughly studied and efforts be exerted to extend the Instructor MOS to a greater period of time.

7. Greater emphasis should be placed on retraining instructors for those instances in which their roles are more of a "resource person" than the traditional role of being an information giver.

8. Several questions arose relating to how an instructional (training) process can or should be validated. I would suggest that the matter of validation of performance items as related to performance objectives are a function of the process (the degree to which the learner has interacted with the instructional and consequential events) and only "face validity" is of concern. This, in fact, is a much simpler problem than the validation of achievement tests which are graded (purpose is to rank the learner).

9. Also, several questions arose dealing with the topic of program evaluation. I suggest that this whole area is one of great weakness in most any type of instructional programs and that in fact new strategies in this area need to be developed. However, it is also equally obvious to me that in training situations, not only the trainee (as a graduate) but also the products of the trainee must be evaluated. For example, if there is an instructor training school, then the effectiveness of the "instructor training program" should be measured (evaluated) by a follow up on the instructor and additionally, the instructors products, the ones whom he instructs. This concept is related to the general concept of educational accountability.

10. Program evaluation was also quite frequently mentioned in connection with the phrase "cost-effectiveness". I did not perceive that cost-effectiveness was the only criterion, exempting cognitive achievement, psychomotor achievement, etc., perceived to be used in program evaluation. Nor, am I denying the importance of cost-effective criteria. However, I do wish to point out that cost-effectiveness is not the only criterion and that when used it must be interpreted extremely carefully. For example, if information acquirement were to be an objective one can generally demonstrate that "drill" as a process is more cost-effective than "discovery learning" as a process, assuming immediate terminal or summative evaluation. In the long run, delayed summative evaluation may show that "discovery learning" is the most cost-effective considering that information acquired by drill is quickly forgotten. This example is an oversimplification of the problem but I hope has been clear in pointing out the nature of the problem area which is obviously not merely a function of "information" nor "drill".

11. In connection with Dr. J. P. Fry's presentation, an important question arose which time did not permit to be effectively answered. The question dealt with how feedback to the instructional system could be effective when the system was one of peers working together to learn and where peers were also involved in evaluation. Might I suggest that in discovery situations, student structured situations and peer evaluation situations, feedback is provided by recording in some fashion the elements of the processes can be compared to terminal performance and those processes providing the most effective (time-cost-achievement-motivation) interaction as measured by

terminal performance can be singled out for use in instructor training. In these cases the instructors, as resource persons or monitors, are aware of and prepared to direct the learning process in proven, meaningful ways.

12. I was somewhat disturbed by the question concerning the use of the new Army General Classification battery scores in ways other than intended. This question seemed to strike a sympathetic note with other attendees. Evidently there is, in the minds of some Army personnel, a rather widespread belief in and a desire to use test data for multiple purposes. This is the concept of the "all purpose test". I would like to point out that tests are constructed for specific purposes and that the inclusion of test data on record where that data is likely to be misused or used for purposes other than intended should receive the attention of the proper authorities. If in fact, the Sergeant Majors School wishes diagnostic information relating to language arts skills, they should rely on data specifically gathered for that purpose.

13. I felt that the presentations of this conference were very well prepared and well received. Additionally, the presentations interfaced unbelievably well so that continuity was not lost. The number of questions asked indicated a great deal of interest in soft-skill type of problems.

14. Since I genuinely appreciated the opportunity to participate in the conference I must express an opinion which I hope is favorably received. I feel that others (like college professor types) who are in the civilian segment would not only be interested in attending such conferences as this but would profit from participating, even as an observor. I think a mutual appreciation and understanding of what the military is doing in the area of teaching-training is important, not only to us (the civilians) but also to the Army. You, in the military are farther along in applications of technology, systems, hardware, software, objectives, etc., (the whole bit) than are the public schools, colleges and Universities.

15. Finally, I detected a feeling from conversations with attendees that the schools (military) do not always share what they are doing. Perhaps this is past history, but if not, then more conferences similar to this one should be held on a regular basis. More learning and greater progress will result from seeing what ones peers or counterparts are doing than will result from any number of directives, injunctions and orders. I believe I might say this another way; specifically that the attendees were sometimes at a loss as to what to do until shown by someone else. They did profit from this conference and they did get new ideas.